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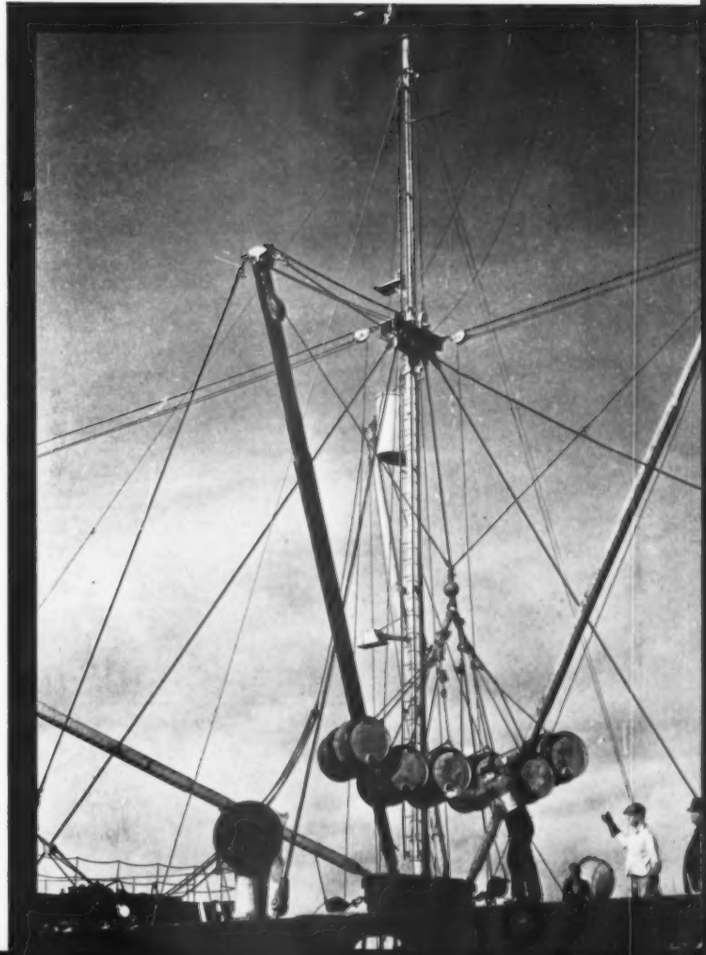
WORLD PETROLEUM

Official World Crude Production Figures for 1930 • Embargo Urged on Foreign Oil Entering United States • D. C. Electric Drive for Drilling • World Consumption of Motor Spirit • French Refining Position • Review of Canadian Refining • Spanish Monopoly



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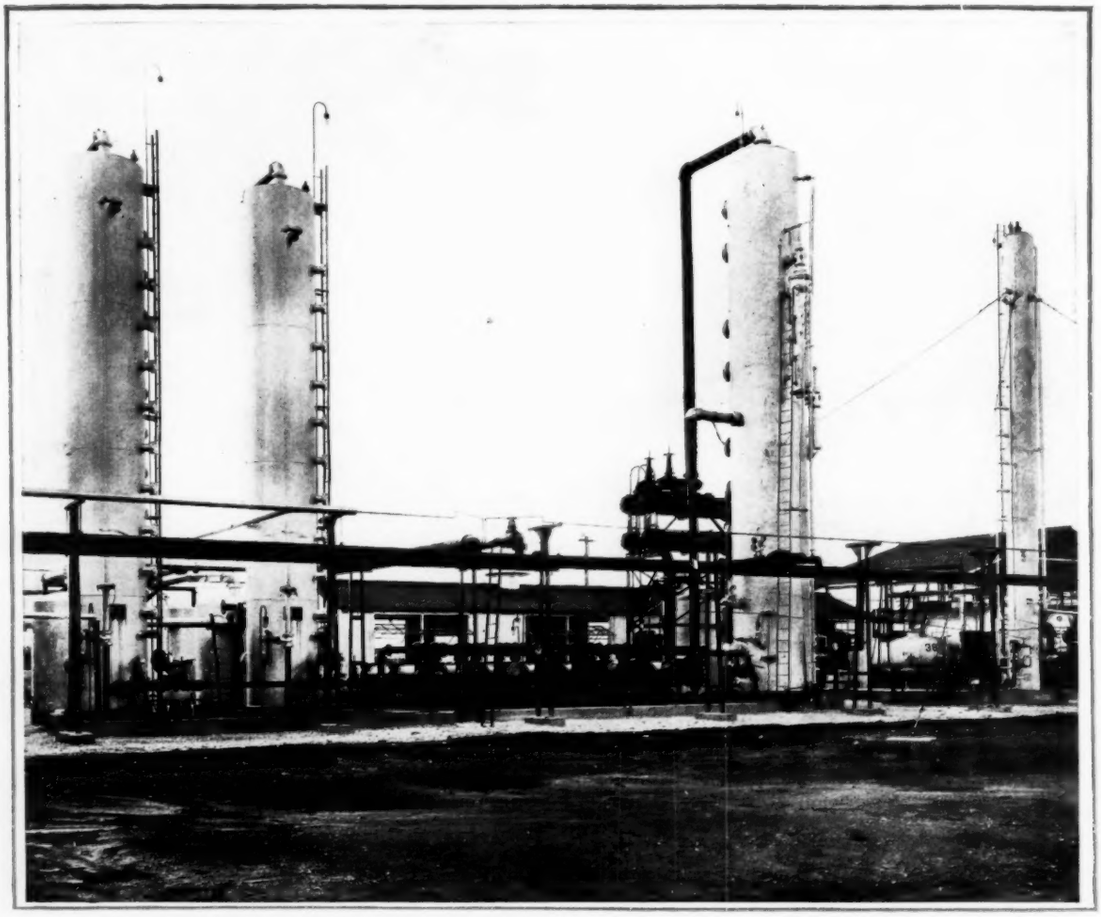

The first of 3 Braun vapor recovery plants in Sinclair Refining Company's Houston refinery. This plant has been in operation 14 months. Increased refinery throughput has necessitated the installation of 2 additional similar but larger plants which will be placed in operation at the same location shortly.

C. F. BRAUN & CO., INC.

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1931

WORLD PETROLEUM

Executive-Editor, T. Orchard Lisle

VOLUME II NUMBER 2

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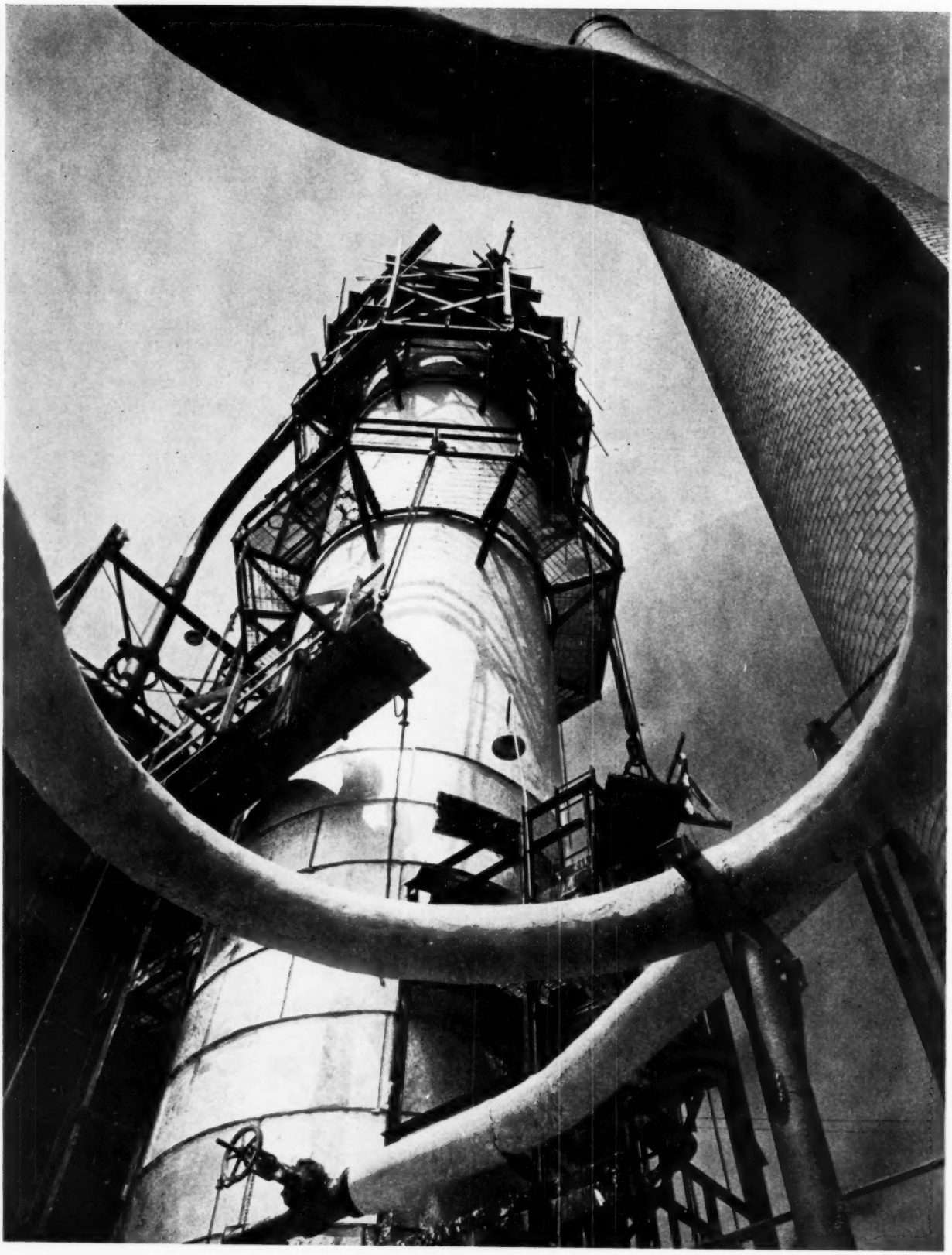

Bubble Tower at the Sun Refinery. M. Rittase

NEW YORK • WORLD • LONDON

PETROLEUM

It's a Long Haul

OF late there has been much agitation in Australia over the high cost of motor spirit, which now is fifty-two and fifty-four cents per Imperial gallon, the latter being about one-fifth greater than the United States gallon, as the American motorist discovers when visiting Canada. O. W. Darch general manager of the Shell Company of Australia, Ltd., has several interesting remarks to make on the reasons thereof. Most of Australia's gasoline is imported, and is subjected to a duty of fourteen cents per gallon, plus two-and-a-half per cent ad valorem. In the face of this initial expense the Australian pound stands officially at a discount of nine per cent from the English pound sterling, and commercially the discount often is actually greater. Transportation vehicles, such as tank wagons, and road-curb pumps, are more expensive than in other countries and are also subject to import tariffs. Distribution also comes very high in Australia, averaging about twelve cents per gallon. Income tax, evaporation and leakage losses, exchange, interest on capital, facilities, etc., absorb about five cents per gallon, and resellers' margin is about six cents, while wharfage and landing charges account for about one cent per gallon. As a result the importing oil company receives from fourteen to sixteen cents net per gallon, f. o. b. ship at wharf in Australia. In answer to the agitation similar statements to those of Mr. Darch have been made by H. C. Cornforth, managing-director of the Vacuum Oil Company, Pty., Ltd., and by E. A. Beverly, managing-director of the Texas Company (Australasia) Ltd. Australia imports 6,000,000 barrels of motor spirit, and refines 3,000,000 barrels of crude.

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Coals to Newcastle

OIL, like water, finds its own level. To where it will flow depends not only upon supply and demand, but also on production costs, and upon the price at which it can be sold with profit over the long period. Consequently we find steady streams of oils passing themselves on the high seas in their flow to the markets of the world. Yet every once in a while, furore is created and the cry "Carrying coals to Newcastle" is raised, such as with the recent delivery of 80,000 barrels of motor spirit to Tampico, Mexico, refined at Aruba, D. W. I. from Venezuelan crude; also, the cargo of motor spirit delivered to Baltimore, Md., from Russia. The lesson to be learned from such competition is that oil produced from fields where lowest production and refining costs reign can be marketed anywhere in the world at any time. When surplus stocks cause or enable unusual sales to be made they are not likely to be of permanent nature, so play no important part in international petroleum commerce. When the Russian gasoline was contracted for, the United States seaboard price was about nine cents per gallon. By the time delivery was made—and at over five cents—there had been a heavy tumble in prices, so the importation is likely to result in a loss to the importer.

Now is the ideal time for the closest form of collaboration between oil companies and manufacturers to discard antiquated equipment and practice and to produce improvements in drilling and refining methods that will ensure the very lowest possible production costs. Collaboration between producers in the various oil pools is also very necessary to reduce overhead and production costs. These things are vitally important now oil prices are at their lowest. Only the man or company producing at a profit can stand the gaff over a protracted period. Low production cost places the producer in a strong position to meet competition in any market of the world.

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Russia a Vital Factor

EVERY oil company executive whose business is directly, or indirectly, connected with World trade in petroleum should turn to page 162 of this issue of WORLD PETROLEUM and carefully study the speeding-up program of production and refining just ordered by an Executive Committee of the highest prerogative in Soviet Russia. The commands of this "highest of the high" will be carried out under the jurisdiction of the Supreme Council of National Industries, so must be seriously regarded. To date the Soviet oil industry is somewhat behind its program, and to make certain of attaining

the huge output of 331,000,000 barrels by the year after next, enormous quantities of new drilling, refining, power and transportation equipment has been ordered to be constructed. Complete details are given in a special article in this issue.

This year Russia will take second place in World crude production, supplanting Venezuela in which American, British and Dutch companies are deeply interested, the South American country's output having been recently cut due largely to American agitation. Last year the Soviets exported 37,000,000 barrels of crude and products—a very tangible quantity. There is a grim determination behind these Russian super-efforts, which American engineering skill and desire for business has made possible, that cannot be ignored. Consequently it may be deemed time that an International Association of Cooperation was formed and the Soviets invited to join and modify their plans in accordance with World needs, and in accordance with the essential curtailments being made today by other countries. It might prove dangerous commercially to ignore Russia, even if not in agreement with its policies.

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Greater Efficiency Essential

CURTAILMENT progress in the production fields of the United States is proceeding in a very encouraging manner, and is doing much to promote healthier conditions in the petroleum industry in general. Oklahoma, with a seven-million barrel daily potential, has brought its output down to well below half-a-million barrels a day. There has been a sharp drop in California; but operators have been warned by the general operators' committee that the output must be further cut to a maximum of five hundred thousand barrels daily or the present price structure cannot be maintained.

Even when the present overproductions are brought to a satisfactory operating level, producers are by no means out of the wood. Petroleum is more than ever a world-wide business. America's overseas petroleum trade now ranks second in importance of the nation's exports. Competition from other countries in the world's markets is going to be much more strenuous in the near future. Russia, Iraq, Persia, Venezuela, Netherlands, East Indies, Mexico and Colombia are also going to play very important parts in international oil markets, and those with low cost production will hold very strong positions. Unit operation as now practiced in the Yates pool Texas, and as is likely to be adopted in the Kettleman hills, combined with improvement in production methods will enable America to produce oil cheaper than anywhere else in the world and so maintain, and even improve, her splendid position in the international petroleum business, provided, of course, that further operating economies and increased efficiencies are made by refineries.

A remarkable example of production efficiency was pictured in our story last month of operations in Persia where thirty-five million barrels of crude are annually produced, plus the oil and gas returned to the ground, without over-capitalization and with a staff of one thousand British (including those at the local 100,000 barrel refinery) in addition to a few thousand Persians. The claim of impossibility of competing with low cost native labor does not hold good because of the enormous comparative cost of maintaining the imported labor, building roads, settlements, hospitals, etc. It is the low cost methods that count!

The capital of the Anglo-Persian is $120,000,000, and to date from 350 wells a total of 320,000,000 barrels of crude has been produced and refined. A fleet of 86 tankers is owned and operated, hundreds of service stations, two big refineries, tankfarms, etc., and 1500 miles of roads have been built. By way of contrast take the Oklahoma City pool where *the drilling investment alone* has amounted to $107,000,000 for the total of 38,000,000 barrels of crude produced by small and big companies from 825 wells. The terrific waste involved by indiscriminate drilling and production, and the enormous savings to be gained from unitization are obvious.

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The Fight for Gallonage

ENCOURAGING progress is being made in the direction of improving conditions of bulk sales of gasoline; but retail prices are still at a low level. In New York State for the six months ending October 31st, 1930, the consumption figures issued by the Tax Department at Albany show an increase of 70,401,406 gallons over the same period of the previous year. A total of 829,899,300 gallons (19,759,507 barrels) was sold, forming a new high record. It other words more business for all. The increasing consumption, undoubtedly was due to the many miles of new and improved roads the State completed in the Spring and Summer of last year. Would it not have been far better to have spent the money now lost, through the continuous price cutting policy, in educating the motoring public of the State to a real appreciation of the true value of standard brands? Efforts could well be concentrated on convincing roadside purchasers that a few cents more per gallon ensures a fine grade of gasoline continuously and everywhere maintained.

One international company marketing two grades of gasoline in New York State finds that over 35 per cent of its sales have been with the more costly of the two, despite that the more expensive fuel is of fairly recent introduction, and that greater advertising and sales effort have been devoted to the cheaper grade. Yet, there exists a range of six cents between its higher grade spirit and the lower of the two grades of cheaper fuel handled by a small company that has always sold lower priced gasolines in this State. In almost every other line of industry products of different qualities and prices are successfully marketed without coming into serious competition with each other. Why not greater progress in this direction in the oil industry, where already the public is virtually trained in recognizing values in lubricants.

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Oil Machinery Exports

COMPLETE returns of exports of American oil well and refinery machinery for the entire year of 1930 are not yet available, but the U. S. Department of Commerce has issued figures for the eleven months ending November last. It will be a surprise in some quarters to learn that the eleven months' total reached the sum of no less than $22,519,000.00, or only about half-a-million dollars less than the same period during 1929, which was $23,002,000. Shipments of equipment were divided as follows: Oil and gas well drilling apparatus, $9,130,000.00; oil refining equipment $12,455,000.00; other oil well drilling apparatus, $934,000.00. Probably, the total value of exports for the twelve months' period will approximate $25,000,000.00, or about the same as 1929, which was a record year. These figures do not include the tremendous mass of other supplies used by oil companies in their operations overseas, which of course are classified under other headings and are not segregated by the Department in as far as the oil industry is concerned.

American Oil Men and the Tariff Question

Independent Producing Group Carry on Determined Fight For An Import Duty on Crude and Refined Products at Oil Relief Conference at Washington, D. C.—Temporary Embargo Urged.

THE movement to check the free entry of foreign oil into the United States is undoubtedly gathering momentum. Its enthusiastic advocates have inflamed themselves to a pitch where nothing short of an embargo will meet their need. Many leaders in the oil industry who were neutral or indifferent to the issue a few months ago have crystallized their views in favor of some such step.

The fight against foreign oil enjoys the benefit of unusually able direction. No one can read Wirt Franklin's recent utterances without feeling his absolute sincerity and admiring the extremely able way in which he has endeavored to reply to the arguments against his proposals. In relatively short time he has perfected a nation-wide organization, largely volunteer, and has imbued it with much of his own enthusiasm. Great adroitness has been shown in handling the publicity and marshaling political forces.

There are several factors operating which make the prospects of Mr. Franklin's ultimate success much brighter than they were a few months ago. In the first place the general character of the present depression has made the public lend a sympathetic ear to sick industries and their needs. Then too a growing fear of the consequences of Russian dumping has spread through American industry, generally accentuated by the investigations and report of the Fish committee. This factor alone has lent considerable force to the movement for a protective tariff or embargo.

The change in the complexion of Congress as a result of the fall elections has increased its unmanageability and greatly strengthened the opposition to the administration. Theoretically the Democratic party is opposed to tariffs, but in actual practice every Congressman believes in protection for the industries of his own state.

Mr. Hoover's failures and political ineptness have aroused many bitter antagonisms on the hill. The fact that the Secretary of the Treasury has been identified with a prominent oil company operating in South America plus the fact that the Secretary of the Interior has declared himself in favor of the use of foreign oil has been enough to rouse the anti-Hooverites to another opportunity to score off the administration. This has given a particular impetus to the movement.

There has been also a rather well defined movement of late to build up public sentiment against the Royal Dutch interests in the United States. Many American oil companies produce abroad and import, but the Royal Dutch has been used as the personification of the invader. A bitter attack against the company was recently broadcast over the radio, and we are informed that a boycott movement against the company's stations has been promoted in some sections.

In addition to the favorable factors referred to above the tariff-embargo advocates have enjoyed a field practically free from organized opposition. We have seen no signs of any concerted effort to present such facts as there may be against the proposal or to enlist public opinion.

It is quite possible, of course, that the Royal Dutch is genuinely indifferent to the outcome of the fight, and is quite confident that it has other outlets for such oil as it may be necessary to divert from South America.

The position of the American interests undoubtedly is much more difficult. A tariff would seriously hamper American companies operating in Venezuela. The Standard Oil Company of New Jersey has world-wide facilities which would lend themselves to readjustment, but the position of others, notably the Gulf interests and the Standard Oil of Indiana is more difficult. Partial adjustment to a tariff would be possible, but an embargo would be quite another matter.

It is possible that sentiment ultimately can be whipped up to the point of securing a tariff or even an embargo, for opinion supporting a restriction of oil imports is growing and the administration is at best a feeble champion of its policies. We still feel that it is extremely doubtful that either measure will cure the sickness which has come upon the oil industry in America.

An embargo undoubtedly would bring immediate retaliatory measures from the South American countries most affected and would strengthen the conviction of American selfishness. We believe we are correct in stating that the embargo has never been employed by the United States in peace time.

If a tariff comes the industry will adjust itself to whatever change in the world flow of oil may be necessary. That it will result in higher prices for American crude or a bigger domestic demand does not seem likely.

It seems to us that a greater menace than foreign oil hangs over the American industry today. The tariff agitation has its source in widespread dissatisfaction with crude prices and the arbitrary restrictions on output. It is not unlikely that before the year is out this discontent will be exploited by those who desire for selfish reasons to break down the structure of the conservation movement.

There are some signs that an insidious attempt is now being made to undermine restriction in Oklahoma. If this slight surface crack in the dyke now holding back the sea of oil is deepened and widened the ensuing flood would undo all that has been accomplished during the past year and, spreading to other districts, would make present importation look like a driblet.

—R. P.

Oil Relief Conference

THE Governors' Oil Relief Conference assembled in Washington, D. C., on January 15th, under the chairmanship of Wirt Franklin, president of the Independent Petroleum Association of America, to consider methods for immediate relief of the domestic crude oil situation. Dr. Ray Lyman Wilbur, Secretary of the Interior, brought together the first Governors' Conference at Colo-

rado Springs in 1929, that conference being called to consider advisability of making interstate agreements for the restriction of crude oil production. The conference of 1931 was called with the express purpose of devising means of slowing up of the imports; it was brought together by collaboration of the governors of the oil producing States, their delegates only being in attendance.

Wilbur Opposes Tariff

The conference was preceded on January 6th by a statement of Secretary Wilbur, who definitely declared himself against the tariff on imported oil. In part the Secretary said: "The chief result (of the tariff) would be that the big companies, which now have many wells shut in and not in operation, would open them up, adding to the production. Overproduction is the basic ill of the industry," and also "in the future the country with the oil will dominate civilization. In it will be centered the wealth. America must conserve her supply. If we waste our oil reserves now, we will pay foreign countries through the nose for every barrel we import later. If I were the landlord of this country, I would see that we used as much imported oil as possible, and let the other fellow waste his reserves."

Administration on Fence

During the conference Secretary of War P. J. Hurley, also a member of the Federal Oil Conservation Board, made a statement that "the Federal Tariff Commission is now making a study of oil schedules. No report has yet been made on that subject. The administration has taken no position for or against tariff on oil. The Federal Oil Conservation Board has not officially taken a position for or against tariff on oil. I repeat, the question of tariff on oil is one that must be primarily settled by Congress," and "The primary question to be considered is whether or not a stage has been reached in the oil industry and Congress can be convinced that it is vital to the welfare of the oil producing states to put a tariff on oil."

Mr. Franklin's Views

The keynote of the conference was the speech made by Wirt Franklin. After a general summary of the domestic crude oil situation, Mr. Franklin argued that former primary objection to the tariff, which was the maintainance of the refining industry and consequent employment in the United States, does not hold true any longer since major companies, Shell and Pan-American, (S. O. of Indiana) have in operation off the coast of Venezuela huge refineries, with total daily capacity in excess of 390,000 bbl., and that the gasoline from these refineries is being marketed in United States. Mr. Franklin also argued that the prevalent opinion that the tariff should not be passed because the oil exports are greater than imports is not correct, since in numerous industries which are protected by tariff same is true even in a greater degree. While Secretary Wilbur contended that the imports into United States are negligible as compared with domestic production, being only 10 per cent, Mr. Franklin considers this 10 per cent surplus as the primary demoralizing factor in the industry, as recognized by economic laws. Mr. Franklin closed his statement by saying that he does not consider the tariff as a cure for all ills in the oil industry, and that if a tariff is passed sane development and production in domestic fields must continue to balance the supply with the demand.

Interstate Compacts Essential

On January 16th Secretary of the Interior Wilbur addressed the conference, avoiding entirely the subject of importations. He advised the delegates that interstate compacts were the only means of effectively solving the difficulties of the oil business.

Petition to Congress

The conference adjourned on the 16th of January, sending a petition to Congress, which after stating the current conditions within the oil industry recommended as follows: "For the above reasons we, the representatives of the petroleum industry, the business interests, and the farmers and laborers of the oil producing States, duly appointed and accredited by the Governors thereof, in convention assembled in Washington, D. C., this the 15th day of January, 1931, do hereby solemnly petition and urge the Congress of the United States to enact without delay a law placing an adequate tariff upon imports of crude petroleum and its refined products, or in the alternative we pray that the Congress enact without delay a law limiting the importation of crude petroleum to 20 per cent of the amount imported during the calender year of 1928, and that in the interest of American labor the law absolutely prohibit the importation of any of the refined products of petroleum, said imports to be allowed only from those countries from which petroleum was received during 1928." (Major importers accordingly would be Mexico, Venezuela and Colombia, while Soviet Russia would be entirely excluded).

As a direct result of the conference Senator Capper of Kansas introduced a bill in the Senate limiting the importation of crude petroleum to 16,000,000 bbl. for 1931, 1932 and 1933, and prohibiting all imports of refined petroleum products. The bill further provides that the importation of petroleum from any one country for each of the three years shall be limited to such proportion of the 16,000,000 bbl. as the amount imported into the United States from that country in 1928 bore to the total importations for that year.

Political Support

Several members of the United States Senate and House of Representatives were present and addressed the meeting. Strong attacks were made by oil men on the petroleum policies of Secretary Wilbur who was accused by J. Edward Jones, an oil producer of New York, and vice-president of the Independent Producers Association, of favoring four large companies importing foreign oil. Mr. Jones maintained that Secretary Wilbur formerly was a medical man of practically no oil experience, and without knowledge of broad economic conditions and practical aspects of big business, and had come forth as an opponent to those advocating the tariff on foreign oil. Mr. Jones in addition to his caustic comment on Secretary Wilbur, asserted that more power is enjoyed by the oil monopoly than any other industry, and that the big companies were conspiring in direct variation to the anti-trust laws in combining in agreements to restrain trade in crude oil.

Harold McGugin, Republican representative elect from the third Kansas district, notified the Conference that unless Congress passed the tariff on this session or called an extra session to vote on the tariff he would vote with the Democrats to organize the next house. This would indicate a desire in some quarters to bring politics into this important question.

Resolutions Introduced

Resolutions have been introduced in the House of Representatives, Washington, by Representatives Hoch and Garber to create a special house committee to investigate oil and gas methods with a view to legislation. One of Mr. Garber's proposals would place an embargo against the importation of crude and refined oil, another would provide an import duty of $1.00 per barrel on crude and 50% ad valorem on petroleum products.

Conservation Versus Chaos

A Constructive Examination of the Various Alternatives Which Confront the World's Petroleum Industry at the Present Time.

By J. B. Aug. Kessler

THE policy of conservation of crude oil in the United States seems at present to be in a very critical position. A number of producers feel that the sacrifice which they have been making for a long time now has not been rewarded fairly. Crude oil prices have been reduced several times, and there is no denying that the producers who have voluntarily reduced their production have not been receiving for their crude oil a price which has enabled them to make both ends meet.

The decision of the Prairie to stop buying crude oil has apparently brought the whole matter to a crisis, and there is a grave danger that conservation may come to an end at any moment.

Those who advocate bringing conservation to an end are, I think, inclined to see things in too dark an aspect. It is true that prices have not improved during this period of conservation, but what would they have been if there had been no conservation? Of course they would have been much lower; in fact, the over-production might have become so bad that the disposal of oil would have become a complete impossibility at any price. The fact that conservation has not resulted in bringing prices to a satisfactory level only proves that the over-production during 1929 and the accumulation of stocks has been so serious that even a year of conservation could not result in a reasonable price for crude oil and its products. If a man who is ill goes to bed, and the thermometer does not record a drop in his temperature, that does not prove that he was wrong to go to bed; it only proves that, although he went to bed his fever is not yet over, but if, being disappointed about his temperature, he should get out of bed too soon, his fever might become fatal.

All crude oil producing countries with the exception of Russia and Roumania are subscribing to conservation at present. This is a great achievement, and should not be lost sight of. It means that all the crude oil producing countries with the exception of Russia and Roumania have been working to the same end, and it also means that if conservation comes to an end in the U. S. A., it will come to an end in all other crude producing countries, and over-production will be that much worse.

As to Roumania there has been conservation in that country from July 1930 to December 1930. Notice of their intention to terminate the conservation agreement was given by the Steaua Romana, and the result has been a serious over-production since the beginning of December 1930. I am hopeful, however, that the Roumanian oil industry will soon realize that, although conditions under conservation may not be pleasant, those under non-conservation are disastrous. As soon as they do realize this, conservation will be put into effect again.

There remains only Russia amongst the oil producing countries where no conservation is being applied or contemplated. I need not say much about Russia. Their position in the oil market is no different from their position with regard to any other commodity that they can produce. It is useless to expect them ever to "play the game" in anything. If the Bolshevik regime were to last, this Russian over-production would ultimately make any conservation movement impossible. As, however, in my opinion the Bolshevik regime is rapidly nearing its end, I think it is a reasonable risk to take to continue conservation, ignoring the unfair part that is being played by the Russians.

Those who have lost their confidence in the beneficial effect of conservation often claim that the only way to bring things back to reasonable conditions is to let free competition take its course, and to let the law of supply and demand settle things. Before briefly considering whether this would be a solution, let us be quite clear about one point—that is, that we are all aiming at the same goal, namely, to get the industry back into reasonable conditions. There is no divergence of object; there is only a difference of opinion about which is the best way to go.

The theory that the free application of the law of supply and demand is the only sound cure is, in my opinion, old-fashioned and out-of-date. It *was* right in the past when industry was organized on relatively small scale, but now that industry is organized on a much larger scale it no longer applies in the same way, and I want to explain briefly why.

The cost price of a product made, let

GROWING criticism of the industry's conservation program has inspired the managing director of the Royal Dutch Oil Company, Mr. J. B. Aug. Kessler to make the accompanying frank defense of the movement. Mr. Kessler believes that the only safe path for the Petroleum Industry to follow is the one which leads through co-operation to conservation. "If we all 'play the game'," says Mr. Kessler, "the near future will be good enough and the distant future very good. That all crude oil producing countries, with the exception of Russia and Roumania are subscribing to conservation is a great achievement."

us say, in the nineteenth century by old-fashioned methods of production, consisted of a large item in out-of-pocket expenses, and a relatively-speaking small item in standing charges. If a product cost at that time $1 per unit, let us say, perhaps 70c would be out-of-pocket expenses and 30c standing charges, which, of course includes interest and amortisation on the capital employed.

In modern industry this proportion is entirely different. If a product costs at present $1 to make, the out-of-pocket expenses are very likely not more than 30c, and the standing charges 70c. One has only to visualize how things were made at the time, with a lot of manual labor and simple equipment, and that those same things are at present made with much less manual labor and very complicated equipment, to realize that my statement as above is correct in principle. Of course I do not pretend that my figures of 30% and 70% as mentioned above are correct; I only use them to indicate my general thoughts.

Now what is the result of this change in the proportion between standing charges and out-of-pocket expenses? If, in the past, the law of supply and demand was allowed to apply freely it meant that as soon as the sales price of the product which I had in mind in the above illustration dropped to below 70c, the production was restricted automatically, and therefore the cure had started to work. If, at present, the law of supply and demand is allowed to apply freely, the restriction in production will only set in when the sales price has dropped to below 30c. In other words, the cure does not work nearly so quickly. Of course the free application of the law of supply and demand *does* mean even now that no new equipment for the production will be erected, but it no longer means—as it used to do in the past—that, unless there is a voluntary arrangement about restriction, production units that have been erected already will be shut down, except possibly on a very small scale by those units which are not modern in their equipment.

My conclusion therefore is that the modern equipment of industry brings with it the absolute necessity of voluntary arrangements for conservation of production in times of over-production.

There is another thing that we must not forget. The technical side of the crude oil production business has made rapid strides forward during the last few years. We can drill much deeper wells in a shorter time than we could in the past. The geological methods, also, have been improved enormously, and the result is that we find oil where we never thought there would be any, and once we know that there is oil in a certain place we can develop a field in no time.

We really had no right to expect that this development in the technical side of the oil business would synchronise perfectly with the increasing demand. Of course it would have been too much good luck if it had. In fact, we all know that it did not synchronise, and therefore we have at present this over-production, but do not let us be downhearted about the consumption of the future. In my opinion the consumption in years to come will be pretty well without limits. Think of the very restricted use of motor cars in most countries, and think of the possibilities of aviation; also the enormous future which is still ahead of the Diesel motor, and a good many other things which I need not mention just now, and I do not think that anybody who has ever given a thought to these matters can be other than optimistic about the future consumption. The only thing that the industry has got to do is to see that the synchronisation which I mentioned above, and which did not come about automatically, will be put into effect by voluntary and friendly co-operation. If we all "play the game" the near future will be good enough, and the distant future very good. If we do not co-operate the near future will be bad for all, and disastrous for many, and the distant future will have to bear the burden of the damage done in the near future.

Still a few words about finance. In case of non-conservation and the free application of the law of supply and demand, the industry, and especially the smaller units of the industry, will be looking for financial support in order to keep the pace. Will they find it? If they do not, it will ruin them, but the cure of those who believe in the free application of the law of supply and demand will have set in. If they *do* find the financial support for which they are looking, it will only delay the day of reckoning and it will delay the cure setting in. In my opinion they *will* find financial support. There are always a number of financial interests which do not know the industry, and which will be misguided enough to give the support. The world flow of wealth is to the United States; there is no doubt about that, and therefore, although conditions in the United States are difficult at present, after some time the United States will again realize that they form the richest country in the world, and there will be a surplus of capital available. Part of that surplus will be well invested; part of it will be badly invested, and there is no doubt in my mind that part of it will find its way to the financing of the "lost cause" which the free application of the law of supply and demand would be for a number of the smaller units of the industry. The part that will be applied that way will be badly invested and lost, but I have no doubt that part of the accumulating wealth of the United States *will* go that way.

Taking everything into consideration, in my opinion there is only one solution for the oil industry, and that is conservation and co-operation. And do not let us despair about the results obtained up to now. I agree that in money the results for the producers have not been good, but still they have been much better than they would have been if there had been no conservation, and the fact that all countries with the exception of Russia—and I hope temporarily with the exception of Roumania—subscribe to conservation, means that sound foundations have been laid for a much brighter future. Do not let us waste these foundations, but let us build on them.

London, 20th January, 1931.

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Oil in Cuba

ACCORDING to reports, J. W. Van Dyke, chairman of the Atlantic Refining Company, on January 23 assured President Machado of Cuba that there exists excellent oil fields in his country. The President offered to assist the Atlantic Refining Company in its search for oil in Cuba.

About the same time a new alcohol bill was being introduced into the Cuban Senate which would place prohibitive taxes on crude oil and all petroleum products, including gasoline, with a view to encouraging the production and use of commercial alcohol from sugar for automobiles and other internal-combustion engines.

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Colombia's New Oil Bill

SEVENTEEN points in the new oil bill, already passed by the Colombian Senate and now before the House of Representatives, are unfavorably regarded by the Gulf Oil Company, Texas Company and Sinclair Exploration Company. These companies announced in the Bogata NUEVO TIEMPO for January 29th that these adverse points—if finally passed—would prevent them from operating in Colombia.

World's Largest Kerosene Plant

Plant Equipment Fabricated in Germany and Shipped to Los Angeles. Successful Operation of Small Plant in Producing Desirable Export Kerosene was Factor in Erection of New Large Unit.

In order that the company might meet the export demand for kerosene, the Union Oil Company of California early in 1930 completed plans for erection and installation of an Edeleanu unit at its Wilmington refinery. This kerosene treating unit, capable of treating 7,000 bbl. per day of kerosene stock, and the largest in the world, was put into operation on December 2nd last. The successful operation of the 850 bbl. plant installed at the Oleum refinery in 1926, and the fact that kerosene treated by this process has found favor in the overseas trade, were deciding factors in installing this type plant at Wilmington.

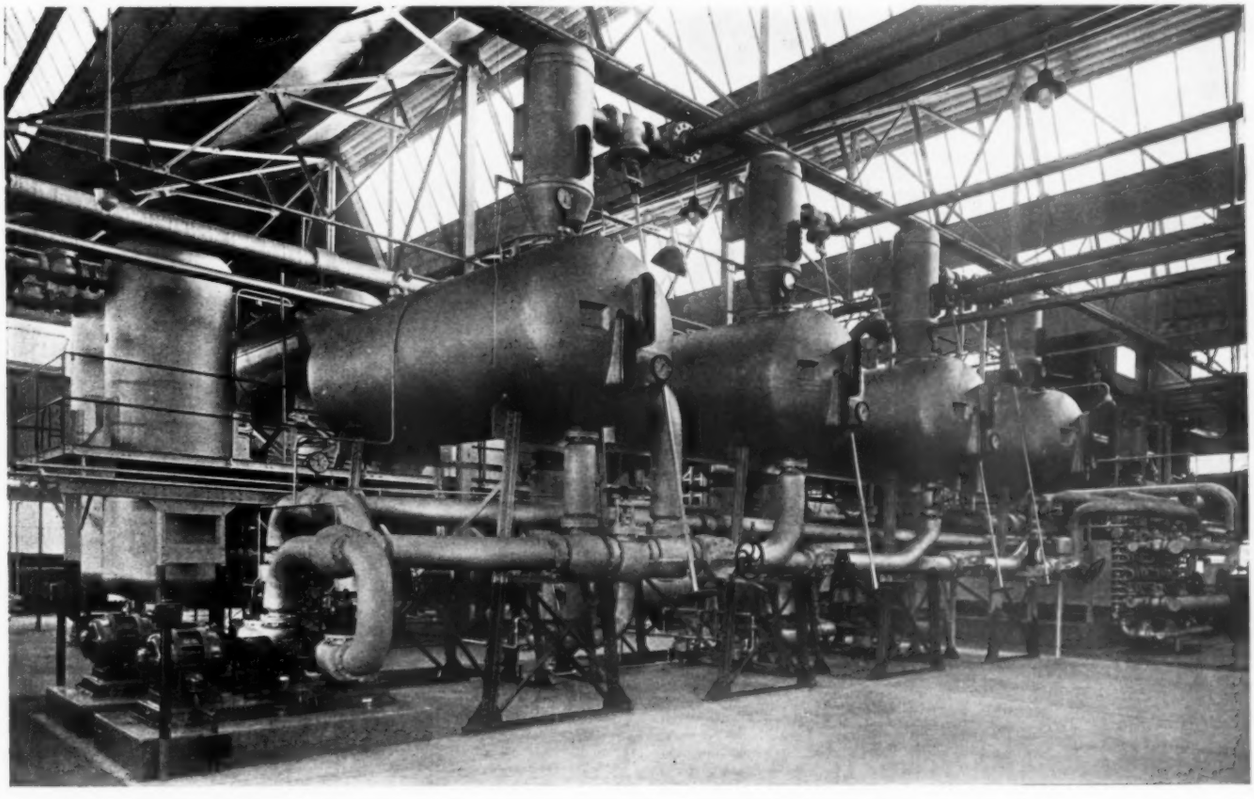
Purification of kerosene stock by the Edeleanu Process is accomplished by mixing the crude kerosene with sulphur dioxide at a temperature of approximately 15 degrees Fahrenheit. Undesirable constitutents, such as coloring matter and so-called aromatics, are dissolved by the sulphur dioxide and settle out of the mixture, while the treated kerosene stock accompanied by a small quantity of sulphur dioxide flows from the top of the mixers. The sulphur dioxide is then recovered from the oils by evaporation, after which it is compressed, condensed, and returned to the mixers for re-use.

Salt filters remove any moisture in the kerosene stock as it enters the plant. The stock must be "dry," otherwise the moisture would combine with the sulphur dioxide and produce a corrosive agent which would soon destroy equipment. The stock then passes through a deaeration tank in which a partial vacuum is maintained, thereby removing any finely divided air particles suspended in the oil.

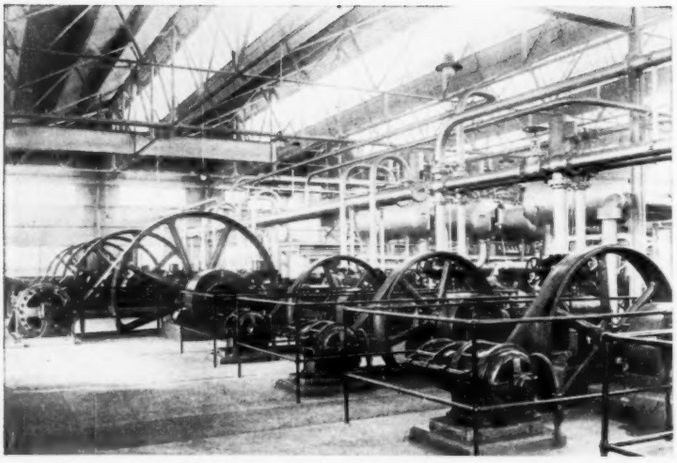
Aside from the building, circulating water system, structural steel supports and electrical apparatus, all plant equipment was fabricated in Germany and shipped direct to the Los Angeles Harbor. Total shipments approximated 775 tons, and consisted of compressors, pumps, evaporators, condensers, heat exchangers, interconnecting piping, etc.

The building housing the equipment is 130 feet by 180 feet in nine 20-foot bays, and is of saw-tooth roof construction providing excellent lighting conditions. Interior surfaces of the roof are painted white, while most of the equipment is finished in aluminum—a very efficient combination from the standpoint of light reflectibility.

Five sulphur dioxide compressors and four vacuum pumps are at one end of



Evaporators in which sulphur dioxide is evaporated from finished kerosene.



Battery of vacuum pumps and sulphur dioxide compressors.

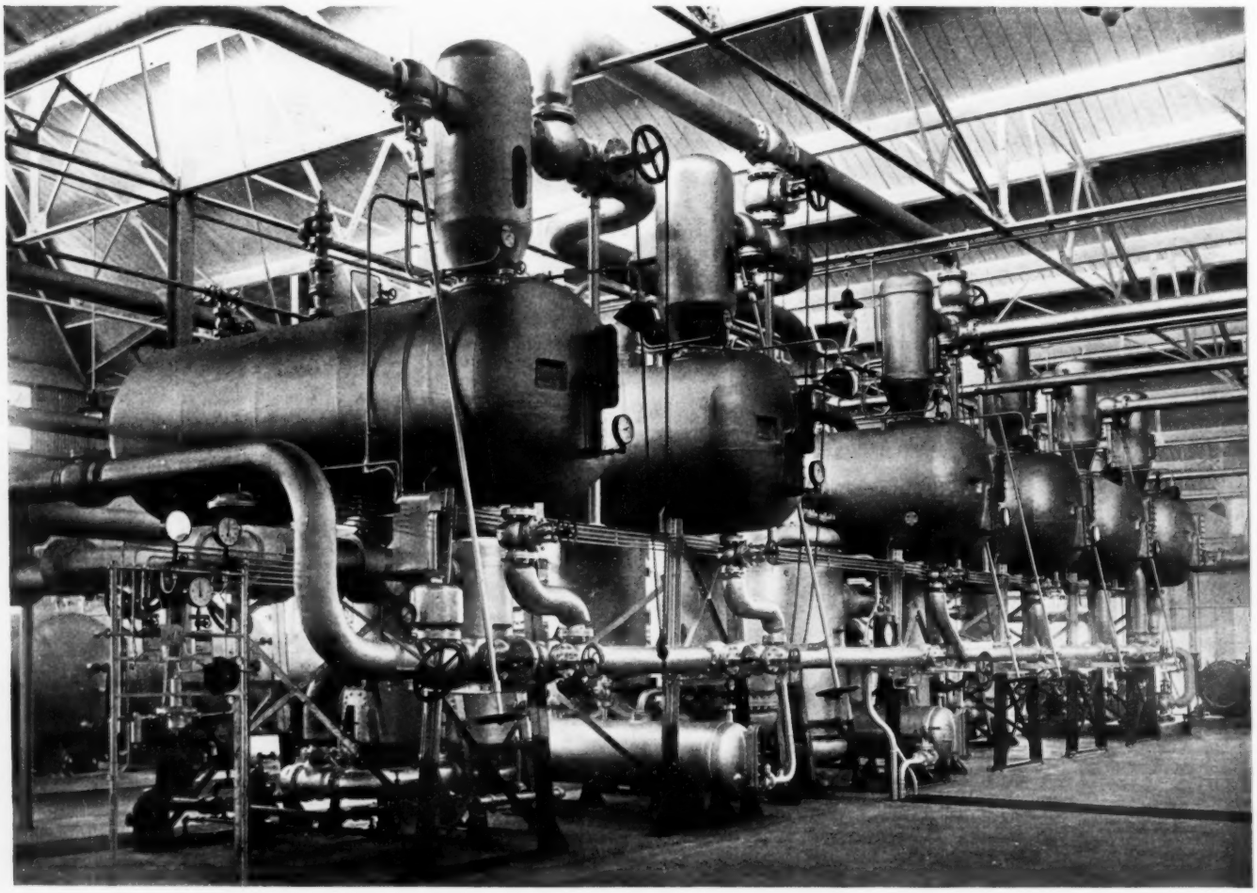
Konstantin Stolpe, erecting engineer (right), and C. M. Hoag, technical assistant of the Union Oil Co.'s manufacturing department.

the main operating aisle, flanked on either side by a series of evaporators. At the other end of the operating aisle are two large vertical mixers, 32 feet in height and 4 feet in diameter. These towers are equipped with special plate glass-covered liquid level gauges placed in staggered positions from top to bottom. A small, protected beaker of sulphuric acid absorbs any moisture present, thus allowing accurate readings.

The fourteen centrifugal pumps in the main building, each equipped with a direct-connected motor, are arranged in pairs and located near the apparatus from which they take suction. Aside from direct-connected motors, each pump is equipped with four vacuum pumps and five sulphur dioxide compressors.

A complete system of heat conservation is carried out through the use of six double-pipe heat exchangers located at convenient points in the building.

The heat lost in the process is that which is introduced in heating the refined oil and extract with steam for the



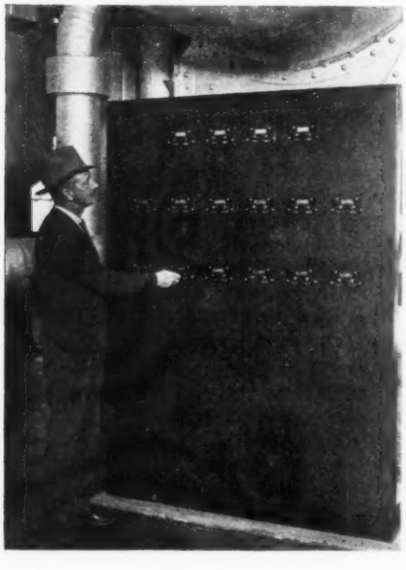
Extract evaporators in which sulphur dioxide is evaporated from the extract. No use has yet been found from the residue.

purpose of vaporizing the sulphur dioxide in these oils, plus the heat of compression which is added to the sulphur dioxide as it passes through the compressors. Most of the lost heat, however, is taken up by circulating water and dissipated at the cooling tower. All equipment which would absorb or radiate heat is insulated either with cork, in the case of low temperature equipment, or with magnesia for the apparatus operating at temperatures above atmospheric.

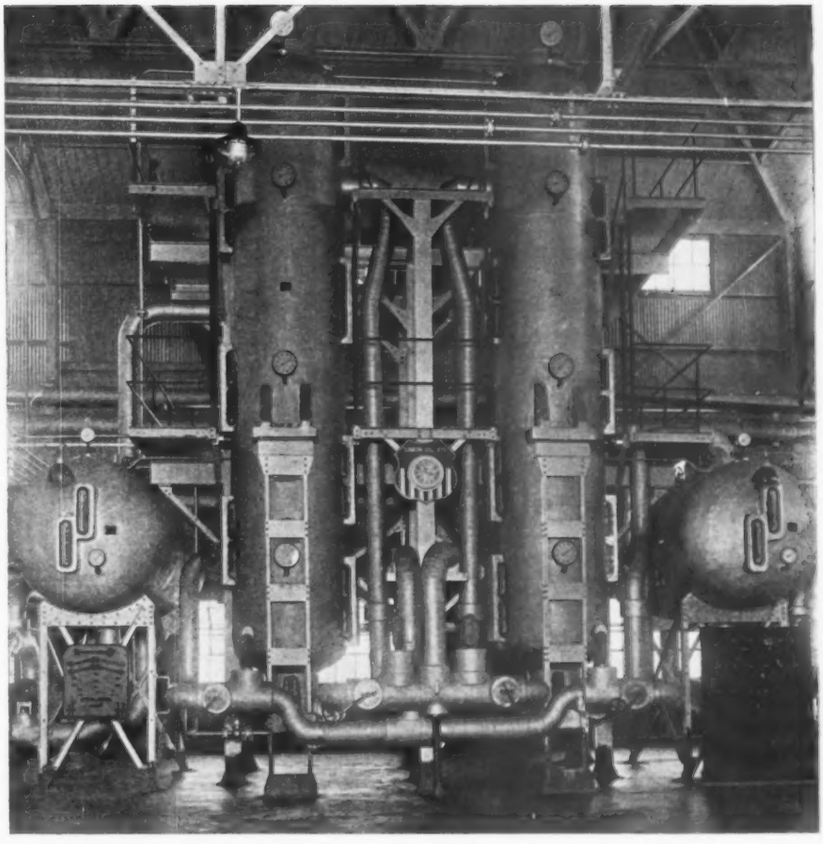
In a separate building are located the three centrifugal circulating water pumps, each with a capacity of 4,200 gallons per minute, direct-connected to their respective motors. One pump delivers cold water from the basin of the cooling tower to the distribution troughs above the sulphuric dioxide condenser coils; another handles the warm water from the basin of the condensers to the top of the cooling tower while the third pump is a spare.

In the south end of this building are found the local laboratory and electric controls. The control room, 18 feet by 54 feet, contains the switching equipment, transformers and motor-generator sets controlling the 33 motors in the plant which have an aggregate rating of 1,475 horsepower. All the motors in the main building are remote-controlled by push-buttons located at each unit, while a duplicate set of buttons is installed near the operator's desk. An emergency set of switches, to be used in case of extreme leakage of sulphur dioxide, has been installed one at each corner of the building by which the main circuit breaker in the control room can be opened, thus shutting down the plant completely.

A. L. Reynolds, construction-engineer, at the master control board.

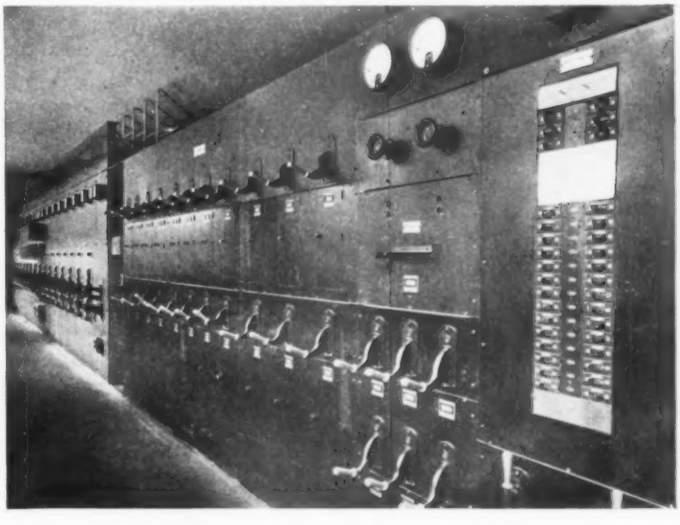


Five 150 horsepower synchronous motors to drive the sulphur dioxide compressors were installed. By using these motors, an annual saving of several thousands of dollars in power cost will be accomplished due to the corrective effect of the motors on the power factor of the electric distribution system.



Duplicating mixing towers where kerosene stock and liquid sulphur dioxide are mixed at 15 degs. F.

In view of the fact that good visibility is essential in the satisfactory operation of the Edeleanu process, considerable attention was directed toward the design and layout of the lighting system. A new type of vapor-proof fixture was developed to meet the special conditions in the illumination of gauge glasses and flow indicators.



Switchboard control of electric pumps and other equipment.

Spanish Oil Monopoly's Status Today

Our Berlin Correspondent Interviews Minister of Finance on Problems Facing the Oil Monopoly When in Spain Investigating Petroleum Situation.

By Dr. Richard Lewinsohn

THE Petroleum-Monopoly in Spain has led to very serious discords. As I noticed during a lengthy investigation trip through Spain there is today a widespread discontent with the monopoly, except within a few bank circles, which, as important shareholders of the monopoly company, are interested in keeping it up, It is principally for political reasons that the monopoly is condemned. The liberai and democratic circles consider the oil monopoly to be an inheritance of the military dictatorship that should be removed as soon as possible. The radical socialist opposition regards the monopoly —not as an act of socialization, but only as an enrichment for certain bankers and, therefore, resents its continuation. Also in conservative government circles there exists discontentment with the Monopoly for various reasons.

All over Spain, and in official Madrid too, there is the opinion that the Monopoly is one of the chief causes for the downfall of the Peseta. One assumes, somewhat naively, that the big foreign oil companies that have been supplanted from Spain by the monopoly, work against the Peseta and support the international bear market. Even if this assumption that the leading men of the Standard Oil and the Shell have, so to speak, "plotted" a conspiracy against the Spanish valuta seems somewhat childlike, it still appears to contain the grain of truth that the monopoly policy of the dictator Primo de Rivera has damaged the Spanish credit abroad.

This foreign-political psychological momentum is strengthened by other, inner internal-political reactions. As is well known, right after the introduction of the monopoly Spain met its demand for oil by supplies from Russia. The delivery contracts with Russia expired on June 30th last year and, as state previously in WORLD PETROLEUM, have not been renewed. On the following day a general strike was declared in several big Spanish cities. In serious political circles in Madrid it was assumed that this strike had been provoked chiefly by Russian agitators, and was a revenge of Soviet Russia for the repeal of the oil treaties.

Another objection against the oil monopoly concerns financial politics. In order to settle with the foreign oil companies whose properties were taken over by the monopoly company, the Spanish government was obliged to raise (respectively to warrant) considerable foreign valuta credits. One of these credits, over £1,000,000 sterling with the English house of Rothschild—was due on the 31, December 1930. Due to the plunge of the Peseta the Ministry of Finance met with considerable difficulties in the repayment of that sum. Because one million pounds sterling now represents sixteen million Pesetas more than it did 18 months ago when the credit was effected. This "loss" of 16,000,000 Ps. caused considerable excitement among the Spanish public, and was charged everywhere to the account of the dictatorship and its doubtful monopoly-politics.

Finally, the Petroleum Monopoly has not yielded financially as much to the Spanish government as was first expected. The Monopoly paid to the government in 1930 a surplus of about 150,-000,000 Ps. A high official of the Spanish Ministry of Finance told me that it would be possible to procure 175,000,000 Ps. for the State by means of a gasoline tax that would not be at all oppressive. This is considerably more than produced by the unpopular monopoly effects. The difference results from the fact that the unpractical administration of the Monopoly works results in very great operating and overhead expenses.

All these arguments found, more or less distinctly, their expression in a long conversation I have just had in Madrid with the Spanish Minister of Finance Wais. In answer to my question whether the Spanish government would be willing to maintain the oil monopoly under these circumstances the Spanish Minister of Finance said, verbally:

"The present government is only a transitory cabinet whose task is to bring Spain back from the dictatorship to the constitutional form of government. Therefore, it cannot be a task of the existing government to take by its own impulse any decisive economical measures. But, the government will put the Oil Monopoly, which has been established by the dictatorship before the parliament which will be elected in March this year as quickly as possible. And, the parliament will have to decide whether it will legalize the Monopoly or not."

The statement by the Minister of Finance indicates that it is not certain by any means whether the Monopoly will be continued. Political circles in Spain consider that at least a "loosening" of the Monopoly will take place. This view is also in accordance with certain negotiations which have been pending for some time. Since the repeal of the Russian oil treaties the monopoly company has been procuring its oil supply mostly from Roumania, but dissatisfaction exists over quality of this oil. In connection with the letter and the foregoing events there has lately existed a tendency to again get in touch with the big English and American oil companies, which have avoided the Spanish petroleum market since the introduction of the Monopoly. As a beginning feelers have been put out to the Anglo-Persian Oil Company.

Considering the general political unsecurity still reigning in Spain in spite of the suppression of the last military revolt, it would be risky to prophesy anything definite. Taken all together one gets the impression that the days of the Spanish Oil Monopoly in its present form are numbered.

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IMPORTS of crude and petroleum products into Great Britain made a new record during 1930, together amounted to approximately 68,700,000 U. S. barrels.

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A. E. BALLIN, who for the past fifteen years has been president of the McIntosh & Seymour Corporation, builders of Diesel engines, which Corporation has lately been purchased by the American Locomotive Company, is retiring from that Company and will be succeeded by Robert B. McColl who is now manager of the Schenectady works.

World Consumption of Motor Spirit

Extent of the International Market for Gasoline. Rate and Dimension of Growth. Relation of Economic Developments in Increasing Demand. . . .

By Dr. Chester Lloyd Jones

Director, School of Commerce, University of Wisconsin, Madison, U. S. A.

IN our issue of June, 1930, Dr. Jones gave a valuable compilation of the World gasoline trade, which in itself is a commodity of international importance. It was illustrated by a map showing the world flow of motor spirit. Because of slowness of official returns it was not possible at that time to cover a later year than 1928 with anything approaching accuracy. This month Dr. Jones paints a new picture of the flow of this petroleum product in international commerce based on automotive power. His analysis will form a valuable guide to executives of oil companies whose business is world-wide in planning their near future distribution. One lesson to be learned from a study of present distribution is the need of increasing new sales outlets and expanding existing motor spirit markets.

FOR all those engaged in the development of industry there are two questions of primary importance; what are the sources from which the materials on which it depends can be secured and what are the markets existing and to be developed in which the manufactured product can find an outlet. On the information concerning these two factors are based to a large extent the plans of forward-looking executives for expansion of their efforts for production and sales.

In the international petroleum industry the rapid development since 1900, and particularly since 1914, has been made possible by a combination of rapidly expanding markets and discovery of new producing fields, the increasing yield from which has been at times, including those in which we are now living, an embarrassment. The problem for the industry as a whole has become not where to find sources of supply, but what to do with the materials offered.

The Rate of Consumption Increase

THE market which lay at the door for developing cheap means of transportation has absorbed steadily rising quantities of petroleum products. But, the farseeing producer has been increasingly aware that the rate of growth of consumption which has obtained in the best markets can not be expected to continue indefinitely. Some of the farther markets, though they still have great possibilities of expansion, will not, at least until their buying power is increased by a higher standard of life, ever approach the purchases made in the more highly developed industrial regions of the world.

As a result it becomes of prime importance for petroleum producers to know how great the market for petroleum products in the world is, how rapidly it is growing, what new outlets are developing and in which of these economic developments are occurring which will directly or indirectly increase the demand for their products. Today this is of the greatest importance because production has run so far ahead of consumption, regardless of a natural growth.

In few if any of the best established industries are the facts available for satisfactory analyses of all the elements of these sorts which are needed to allow definite conclusions to be drawn. In the petroleum industry, which has expanded so tremendously in the last generation, it is not too much to say that there is hardly a single one of its more important features that can be analyzed for estimates in which the possibility of error is insignificant, or in which new factors may not arise to make the conclusions inapplicable.

Information for Programs

RESOURCES, available supplies, methods of production, transport, marketing, the demand in various lines within individual areas and in different parts of the world all these are matters on which the best opinion is and should be undergoing rapid changes. Nevertheless the best information at hand must be utilized for developing current programs. Even if it is not free from errors it is the best for the time being available.

The analysis of the outlet for gasoline and the prospects for its increase which follows is made recognizing the fact that any analysis has to take into account a number of imponderables, that there are in it many points where exactness is impossible and that new conquests of science may make some of its conclusions no longer ones to fit the facts.

World Production of Gasoline

AT the outset we are confronted by the situation that the actual world outrun of gasoline is unknown and estimates of production are seldom made. Many producers outside the United States do not disclose their output.

In the United States there were produced in 1929 some 1,006,681,000 bbl. of crude petroleum. This was over two-thirds of what was produced in the world as a whole.

In the same year we exported 26,000,000 bbl. of crude oil and imported 79,000,000 bbl. Disregarding re-exports, and differences in stocks at the beginning and end of the year, roughly 1,059,681,000 bbl. of crude oil were available to the American oil industry during the

year. Now in 1929 there were produced in the United States 444,104,000 bbl. of motor-fuel, including gasoline, natural gasoline and benzol. This was, by the way, about five times as much as in 1918.

In the entire world there were produced in 1929 1,478,400,650 bbl. of crude. Subtract from this total the total produced in the United States and imports into the United States and we have about 393,000,000 bbl. as the amount upon which gasoline producers outside the United States could draw.

[Crude oil production figures for 1930 are published elsewhere in this issue, and total lower than in 1929—Editor.]

Proportions of Motor Fuels

Now it cannot be assumed that from the rest of the crude oil raised in the world exactly a proportionate production of motor fuels resulted for differences in manufacturing processes, differences in the demand for various sorts of petroleum products, differences in the composition of oils raised, differences in stocks of crude and of gasoline held over, and many other local factors might change the yield. If the motor fuel produced bore the same relation to production of crude as it did in the United States in 1929 the world yield for the year would have been about 599 million bbl.,—probably too high a figure. World consumption figures in recent years, contrasted to those of production above estimated, run at a considerably lower level. Consumption is estimated by one investigator as 488,000,000 bbl. in 1929.[1] Production and consumption of course do not coincide in any given year and stocks have shown a rising tendency but inasmuch as domestic consumption in the United States amounted to 371,852,000[2] bbl. and about 100,000,000 bbl. of motor spirit enter international trade, it appears that the amount of gasoline consumed in the past year probably ran above this figure since these two items alone would almost equal it, though they do not include production for local consumption from local or imported crudes in other countries than the United States.

Automobiles and Gasoline

Of at least as great interest as the amount of gasoline produced and consumed are the purposes for which it is used. Here also we must be satisfied with much less than definite figures. The greatest outlet by far is for motor fuel for automobiles. In the United States it has been generally estimated in the industry that ninety per cent of the total consumption of gasoline is accounted for by this single outlet.

But this calculation, if it was once correct, appears no longer to be so. If automobiles at one time took the reported proportion of sales then apparently the recent expansion of other uses has been even greater than that in the automobile industry.

A more definite analysis of this item has recently become possible through the growing adoption of state laws taxing gasoline used by autos. By 1928 all the states except New York and Illinois had such measures on their statute books. Taxes were paid on 10,695,665,000 gal. or 254,658,690 bbl. On May first, 1929, in New York, and on August first in Illinois, tax laws on gasoline used in automobiles went into effect and the sales reported for all the states for 1929 rose to 12,549,256,000 gal. or 298,000,000 bbl. A total sales tax of $431,636,000 was paid in 1929 in the U. S. A. and $515,000,000 is estimated for 1930 by the U. S. Bureau of Public Roads.

In 1928 the total apparent gasoline consumption in the United States was 328,832,000 bbl.,[1] therefore the consumption by autos it appears was, not counting that in New York and Illinois, about 79 per cent. In 1929 the domestic consumption of gasoline reached 371,852,000 bbl.[2] Motor gasoline consumption, reckoned on state sales of 298,000,000 bbl.,[3] was about 80 per cent of this amount.

Other Uses of Gasoline

Where does the gasoline not used in automobiles go? We know only in the most general way for there is no fiscal legislation to furnish a guide to the various rapidly expanding uses to which refined petroleum products are being put.

A portion, still a minor portion, goes to propel the motors in the rapidly growing industry of air transport. For such ends the Aeronautics branch of the United States Department of Commerce estimates about 78,600 bbl. were used in 1926 and somewhat less than 500,000 bbl. in 1929.

Large amounts of gasoline go into special uses on our farms for running stationary engines for farm power such as thrashing machines, silo fillers, huskers, fodder cutters, mills, lighting plants and a wide variety of similar uses. On January 1st last there were 846,162 tractors on American farms.

Commercial Automotive Power

Industry depends on gasoline increasingly for power for stationary engines, interurban trains, compressors, pumps, excavating machinery, hoists, derricks, pile drivers, cranes and draglines. Motor boats for both sport and commercial use are a rapidly expanding gasoline market. Then there is a large quantity used by the dry cleaning industry. In fact there is hardly one of our major national activities which is not finding petroleum increasingly useful in its development.

Outside the United States the consumption areas are naturally concentrated in large degree in the more industrialized sections of the world where the higher standard of life encourages travel and industrial and commercial activity. To this generalization, however, there are exceptions. Some non-industrial areas like New Zealand are highly motorized. In addition many of the thickly inhabited areas of the world like India and China are relatively unimportant areas in the consumption of gasoline, and give only limited promise for rapid increase in the petroleum trade because of the poverty of their populations. On the other hand these two countries are great consumers of kerosene.

Though definite figures of gasoline consumption cannot be given for the chief markets, a fair indication of their importance may be obtained from the imports of crude (partly refined locally) and gasoline, and from rough estimates of local production.

United Kingdom Second Largest User

After the United States the United Kingdom is the greatest gasoline consumer, with an export-import trade balance in 1929 of 22.9 million bbl., and local production from imports of 13.9 million bbl. of crude. Germany and France are next in line with 17.6 millions and 15.7 millions of bbl. of imported gasoline respectively, and supplementary supplies from local and imported crudes. Next, or perhaps ranking with these is Canada with imports of 4 million bbl. of gasoline in 1929, and refining from an import-export balance of 31.4 millions of bbl. of crude and

[1] John H. Nelson in the *Oil and Gas Journal*, December 26, 1929, p. 138. The estimate is based on the experience of the two previous years when world consumption is listed as 387,000,000 bbl. in 1927 and 439,000,000 bbl. in 1928.

[2] Petroleum facts and figures, published by the American Petroleum Institute, Baltimore, 1930, p. 105.

[1] Statistical Abstract, 1929, Washington, 1929, p. 766.

[2] Petroleum Facts and Figures, Baltimore, 1930, p. 105.

[3] Ibid, p. 106.

from 1,132,800 bbl. of crude locally produced. Australia stands next. It imports 5.7 millions of bbl. of gasoline, and refines from 3,000,000 bbl. of imported crude.

The relative position of the countries next in rank is not easy to determine, for many of them stand close together in reported imports and local refining, on which information is incomplete, may change the relative position in some cases materially. Probably none of them consumes four million bbl. a year, and most of them consume much less. So far as consumption is measured by imports in 1929 the minor markets stand in the order: Italy, Brazil, Sweden, Netherlands, Belgium, Czechoslovakia, New Zealand, Denmark, Union of South Africa, Switzerland, and Cuba. Each of these countries used in 1929 between one million and three million bbl. Argentine local production puts the republic in a class with these consumers.

In most of the countries producing crude oil, except the United States, local consumption is relatively low. This is especially true in Venezuela, second in yield. Russian gasoline production for the first half year of 1929-30 by the main trusts is reported as 6,400,000 bbl., but exports for the same period are listed as 4,880,000 bbl. Mexican consumption as reported by the Mexican Bureau of Special Taxes reached in 1929, 1,630,000 bbl. Persia, the Dutch East Indies, Roumania and Colombia are clearly still relatively unimportant consumers.

Market Outlets

THE market outlets for gasoline within these consuming areas like those in the United States can be stated only in a general way. In the more important units, as in this country, the automobile industry gives rise to the greatest gasoline market. It is significant that the five markets next in importance after the United States as consumers of gasoline are also the five in which automobile registration is greatest.

Automobile Registration in Certain Areas as of Jan. 1, 1930

Estimated by the United States Department of Commerce

Country	No. of Cars
United Kingdom	1,452,481
France	1,296,167
Canada	1,168,188
Germany	642,600
Australia and Tasmania	581,310

There are, however, some interesting variations in the rank of these five countries within the group in the two cases. Canada has nearly as many automobiles registered as has France. It consumes perhaps about as much gasoline as does France, though it seems probable that industrial uses claim a greater percentage of the total in the latter country, especially as a percentage of alcohol is mixed with the gasoline used for automobile purposes.

Germany on the other hand has only half as many automobiles as France, yet as a gasoline consumer in 1929 appears to have consumed appreciably more.

Relative Activities of Automobiles

BOTH these cases raise the question, not one which can be satisfactorily answered, as to the relative activity of the average cars as consumers of gasoline in these countries. In the United States if the total sales of gasoline for motor fuel in 1929, as reported in connection with state taxation, be divided by the number of cars registered at the end of the year the average consumption per car is about 11.2 bbl. or 470.4 gal.

It seems safe to assume that the consumption per car in European countries is probably not greater, and very likely substantially less than in the United States due to the lesser development of commercial trucking, shorter distances in average driving, lower average income of the population, the high average price of gasoline per gallon, and the greater effort made to secure in European cars the "most miles per gallon"—or liter. Even if the average consumption in Great Britain were the same as in the United States, however, the total motor consumption there would be about 16,267,781 bbl., or less than 80 per cent of the import-export balance of gasoline alone. In addition, local consumption includes a very considerable amount of gasoline made from imported crude. It appears, therefore, that the industrial outlets for gasoline must take a greater percentage of the gasoline consumed than in the United States.

France, if its cars consumed gasoline (minus alcohol) at the prevailing American rate, would have been a market for 14,500,000 bbl. of gasoline, a proportion of actual consumption which it seems clear the automobile industry does not actually account for.

Gasoline in Germany

GERMANY furnishes stronger contrasts. The number of registered cars is 642,600. The gasoline imports in 1929 were 17,000,000 bbl. Even if German automobiles consumed gasoline at the average yearly American rate they would take less than 7,200,000 bbl. There is, it is to be remembered, a quantity of synthetic gasoline produced and consumed. Apparently in 1929 automobiles consumed, assuming consumption at the American average, only an amount equal to about 45 per cent of the imported gasoline available during the year. In the years preceding 1929, however, this amount would have exceeded all gasoline imports.[1]

Canada and Australia, especially the former, are countries in which conditions of operation of automobiles are more closely comparable to those in large parts of the United States, and in both the number of American cars is large. In the former if the registered cars consume gasoline at the rate obtaining in the United States, and if the refining yields per barrel of crude substantially equal the average in America, the proportion of gasoline supply taken by the automobile industry appears to be very closely comparable to that in the United States. In Australia, however, the consumption per car must be less than in the United States for at the American rate the automobile industry would consume practically all of the imported gasoline available. In view of the relatively small industrial development of the country cars doubtless do take a much larger proportion of the market offerings than in European countries.

Outside the countries listed above, the gasoline market is remarkably scattered.

The relation of automobile registration to the apparent gasoline consumption in certain of the important consuming areas is indicated in the following table, the figures in which in a number of cases are only rough approximations due to the fact that the local refining returns are not available or are available in incomplete form.

Looking forward from what is, to what is to be, is a favorite occupation of philosophers, but one of which they by no means have a monopoly. It is one shared with all progressive business men, for whom, indeed, it is not a diversion but a duty. What are the most promising areas for increase of the gasoline trade? Increases in purchases will occur in all parts of the globe but so far as recent developments indicate the future lies chiefly in the most industrialized areas where increasing purchasing power and the increase of use of machinery driven by petroleum will assure an expanding market. The areas

[1] It is to be noted, that the gasoline imports in 1929 were exceptional. In 1928 they were 7 million bbl., and in 1927, six million. The difference can not be explained only by growth of the use of automobiles.

Automobile Registration and Gasoline Consumption in Certain Gasoline Importing Countries in 1929[1]

	Autos Registered Jan. 1, 1930	Total Gasoline Consumption for all purposes[2] (bbl.)
United Kingdom	1,452,481	22,965,221 (i, e)[3]
Germany	642,600	20,006,513 (i, e for 1929 and refining for 1926)
France	1,296,161	15,738,226 (i)
Canada	1,168,188	10,170,699 (i, e for 1929 and refining returns for 1926)
Australia and Tasmania	581,310	4,310,366 (i, e, r)
Argentina	364,737	1,283,145 (i, refining returns not available)
Italy	230,509	3,287,609 (i)
New Zealand	173,812	1,775,051 (i, e)
India	164,275	(Imports and Exports Negligible. Local refining supplies the market.)
Brazil	188,349	2,161,930 (i)
Sweden	144,519	2,142,070 (i, e)
Union of South Africa	141,700	1,581,790 (i)
Belgium	113,385	1,774,212 (i, e)
Denmark	100,625	1,440,948 (i, e)
Netherlands	98,428	1,931,192 (i, e)
Japan	73,844	233,648 (i, e, refining returns not available)
Mexico	72,167	1,630,000 (consumption, Mexican statistics)
Switzerland	71,916	1,190,171 (i)
Cuba	50,106	1,180,565[4] (i)
Czechoslovakia	47,100	1,575,235 (i, e, r estimated)
Uruguay	45,975	629,291 (i)
Algeria	44,910	864,811 (i)
Norway	40,650	658,487 (i)
Irish Free State	37,404	744,934 (i)
Austria	37,550	882,396 (i)
Philippines	34,643	615,984 (i)
Poland	34,806	697,000 (i, e)
Finland	33,140	575,747 (i)
British Malaya	31,539	732,553 (i, e)
Egypt	26,385	832,543 (i)
Morocco (French)	23,815	484,314 (i)
Ceylon	19,982	298,476 (i)
Greece	17,850	391,222 (i)
Tunisia	13,741	252,373 (i)
Porto Rico	12,491	447,271 (i)
Syria	9,048	230,555 (i)

[1] The figures for gasoline consumption given are the imports less exports in the countries which have no significant refining. In some cases the import figure has had to be taken because no information is available concerning local refining. In a few cases one of the items in the reckoning, import, export, refining, has had to be taken from a year previous to 1929. The letters i, e, r, indicate the use of imports, exports and refining returns in arriving at the figure used.

[2] Stocks disregarded. The letters, i, e, r, show consideration in the estimate of imports, exports, and refining yield.

[3] Production by the local refineries not available.

[4] Cuban refining is reported at times to reach 2,000 bbl. of gasoline per day.

which best fit these descriptions are the United States and Europe, which, besides its own production, takes close to two-thirds of the gasoline entering foreign trade. As these regions come to greater use of the automobile and develop their motorized industries they will be increasingly valuable outlets for petroleum products.

Construction of Highways

NEXT in promise are a group of newer countries the resources of which are being thrown open to development, which are adopting legislation for greater encouragement of local manufacturers and pushing the construction of highways for the stimulation of their progress. In 1930 this group includes Canada, the Latin American Republics, especially Argentina and Brazil, and outside the new world, Australia and South Africa. Increase in markets in such areas may be slower, at least for the near future, than in the countries where sales already reach good volume, and they will be conditioned by the extent of the natural resources, the climate, the character of the population and access to markets but developments in all of them will be carefully followed by far-seeing petroleum executives. The increase of national wealth, the condition of public budgets, the projects for public services, the growth of local manufacture, advance in mechanization of industry, the rise in standards of living, the improvement of educational facilities, the extension of road systems, these and a host of similar items will be the indicators which the trade will watch to point the way to greater sales in established markets and untried outlets in new ones.

Effect of Economic Conditions

GASOLINE sales, like those of other commodities, will be affected by the general economic conditions in each of the marketing areas and by special circumstances which, as the analysis above indicates, affect some of even the larger markets. But in all of them they seem destined to increase. Consumption in motor vehicles is still in all the great markets the most important factor in the trade, and it will continue to rise in amount as the wealth of the world rises and as facilities for communication increase. In some markets it may, as use of automobiles increases, take a greater proportion of the local market offerings than at present. On the other hand in a number of areas, and among these some of the more important, it seems from the information available that the consumption in this line is either not as great a share of the total as was formerly supposed, or that the growth of the many lesser market outlets has opened fields which in some cases have expanded as rapidly as that for the supply of automobiles.

Will Fuel Oil Supplant Gasoline

WITHIN a few years it is possible that commercial vehicles will extensively use light fuel-oil instead of gasoline, due to recent developments of the high-speed Diesel engine. Fuel in such cases would be sold to consumers in tank wagon lots, and not from the wayside pump. This change, of course, might tend to retard gasoline sales expansion.

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Interference Paralyzing Refining

(Continued from Page 152)

Mons. Loucheur's Bill also contains another clause which exempts all the companies running public conveyances, such as buses, etc. (They are all either subsidized by the State, the Departments, or the Communes), from obtaining the usual license to import petroleum products, which regulation was enforced by a Bill passed in March, 1928.

This exception in favor of organizations in which the State is interested constitutes another error, and a gross injustice as far as the rest of the distributing companies are concerned. To all those closely connected with the petroleum Industry in France there is ample evidence that each new Bill passed by the Government tends almost imperceptibly towards a Monopoly; this theory has been advanced for some time past by one of our well informed French contemporaries, and we are reluctantly obliged to endorse it, for with the best will in the world we cannot see in what way French legislation has helped the petroleum refining industry.

Factors Responsible for Roumanian Depression

By. E. A. Margulius

THE present depression in the Roumanian oil industry—the lowest on record—can be explained by three factors: a. the disastrously low international prices of petroleum products; b. the failure of the conservation of crude agreement, and c. the lapsing off of the cartel for establishing internal prices of products.

Excessive fiscality, expensive transport of products, etc., have in the past, taken the cream of the profits of the oil business. Now the three factors mentioned above have lent a hand to make a problem not solely profit making, but the very existence of oil industry itself. This problem is darkened by the shadow of the general crisis reigning all over Europe, and by the scarcity of credit, which renders a transfusion of fresh blood into a tired organism practically impossible; in other words finding new money for bridging over the difficulties confronting our industry.

Leaving out the question of the collapse of the world prices as one which is too well known, one has to regret that the agreement for the conservation of crude oil is still at the deadlock mentioned in my article in January WORLD PETROLEUM, and that, to say the least, the half-hearted attempts to re-establish the agreement are doomed to failure so long as some of the bigger companies are loath to put the problem of the future of oil industry in general before that of their immediate welfare. One must add, however, that practically all the big companies are producing, in spite of the abolition of the restriction, considerably under the potentiality figures of the test of the 12th September last.

While the potential production of the Roumanian oilfields was ascertained, then, at about 3,200 tank cars per day, the present daily production hardly ever exceeds, if at all, the 2,000 car figure.

Another very severe blow to the Roumanian oil industry has been the denunciation of the Cartel for the regulation of internal prices and sale of products. By the old convention, which expired on the 31st December last, the smaller refineries enjoyed a protection quota, as follows: refineries handling up to 3% of the total refined quantity of Roumania, had their normal quota multiplied with figures ranging from 1.5 to 2.5 according to the capacity of that particular refinery.

The practical results of this convention were that bigger refineries received about Lei 1,500 per tank car of crude (835 Lei equals $5 U. S.) as surplus, while small refineries received sometimes as much as Lei 3,500 per car. This has been a great help for the oil industry, especially when one considers the low level of world prices of petroleum products. This advantage could have been made greater in importance by a campaign for the intensification of the internal consumption of products. Only about 30% is now consumed within Roumania itself and this represents comparatively a very small figure in the country's production.

At present discussions are carried on for re-establishing the Internal Cartel, but here again we are facing a deadlock. The Distributia Group (Astra-Romano, Steaua-Romano, Romano Americana) are opposed to the renewal of the convention on the basis of the protection quotas, and it is common knowledge that the Astra Romana and Romano Americana Companies make the conclusions of the Conservation Agreement the conditions for their adhesion to the Cartel.

A rather bad sign, and one which indicates that the possibilities of the re-establishing of the cartel in the immediate future are somewhat remote, is the fact that in the last 10-12 days very important contracts for motor spirit, kerosene, etc., have been signed for internal consumption at prices approximating the world prices.

The only bright spot on the horizon is the convention for the sale of fuel oil in Roumania. The State buys about 70% of the total fuel oil used in Roumania. All the deals with the State for this product have to be made through a common office representing all the refiners. Already the supply necessary for the State railways (about 5,000,000 bbl.) has been contracted for at the price of 0.65 lei—the world parity being about half that price.

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Higher Prices for Crude Oil Advisable

By Richard Airey

U. S. Representative, Royal Dutch-Shell Group

IN our opinion, collapse of pro-ration will undoubtedly lead to chaos. We think the small producers should be recompensed for their sacrifice and the price of crude oil should be higher. It is manifestly unfair to ask a producer to curtail his output and, at the same time, penalize him for doing so.

Without pro-ration one can easily imagine what can take place by reference to the conditions in 1915, when uncontrolled production in the Cushing Field brought the price of 39 Be. crude oil down to 28 cents per barrel and crude oil then produced is still in storage.

Establishing normalcy in Roumania's oil industry seems as difficult as the task of extinguishing Well 160, which has been blazing for about 18 months.

Interference Paralyzing French Refining

State Politics For Over Three Years Strong Factor in Retarding Progress. No Change in Sight Before May, 1932. . . .

By E. J. André

IN all justice to the French, especially to those interested in the petroleum industry, it must be said that they are a patient nation! They have been fed upon vain promises for three-and-a-half years now, and still do not appear to grow restive. One Government has succeeded another (13 in six years) and the problem of the refining industry has still to be solved!

Great things were hoped of the Tardieu Ministry, the discussion of the ratification of the two Agreements between the State and the C. F. P. was on the Parliamentary programme every day during December, and it is now quite obvious that licenses to import crude oil will not be delivered until that question has been settled; but, no one had foreseen that Tardieu would have fallen before the end of the Christmas session, nor had they expected that the discussion of the National Equipment Bill would have been such a lengthy proceeding.

THE Tardieu Ministry having been defeated by but three votes in the Senate, Mons. Doumergue did his best to resolve an extremely knotty problem as quickly as possible . . . according to the French Parliamentary traditions! After some unsuccessful attempts made by others, Mons. Steeg finally accepted responsibility, but though he managed to form a Ministry, its existence was so precarious (he was only able to obtain a majority of seven votes) that, taking the line of least resistance, he closed the Parliamentary session in order to gain time before the Chamber could bring about a fresh ministerial crisis.

The present precarious situation will doubtless be prolonged until the next General Election which is due in May, 1932. The fact is, that strife between the different parties is so accentuated and the situation often becomes so strained over futilities, that no Ministry can ever feel confident of retaining a majority for long. Even should Mons. Steeg and his colleagues contrive to remain in office for some time they will have so many questions to settle (Budget, National Equipment, National Defense, etc., etc.) that unless pressure is brought to bear it is doubtful whether the Agreements between the State and the C. F. P. will even come up for discussion until some months have elapsed.

The question is—*who* could bring the necessary pressure to bear? Undoubtedly the one man is Mons. Loucheur, the great French economist, who is both President of the "Office National Des Combustibles Liquides" and Minister of National Economy in the Steeg cabinet.

UNTIL a few weeks ago the Ministry of National Economy did not exist. It has been created by Mons. Loucheur who has transformed and developed the Ministry of Commerce and Industry so as to enable it to deal with all questions appertaining to the Economy of the Nation, and more especially to be able to handle Mons. Tardieu's program "de l'Outillage National" (National Equipment). This program, if it develops as it was planned by Mons. Tardieu, will entail an expenditure of several billion francs, and its main purpose is to diminish unemployment in France during the existing financial and industrial crisis.

Mons. Loucheur in his double capacity of Minister of National Economy and of President of the O. N. C. L., can, if he chooses, and in the event of the present Cabinet remaining in power, bring up the discussion of the Ratification of the Agreements almost as soon as it pleases him to do so.

He has already shown the petroleum industry that it is his intention to hurry matters on, for, within two days of taking office, he induced the Senate to pass a bill which will probably come to nothing, for it has still to be passed by the Chamber of Deputies, and indeed, from an economical point of view, it appears to be almost an absurdity.

THE new bill proposes to constitute a commission in each of the "Departments" of France with a view to establishing the maximum price at which gasoline can be sold in the Departments. The Commissions are to be composed of nine persons representing the State, on the one hand, and the different groups interested in the sale of gasoline on the other. These persons will have to follow the fluctuations of the petroleum market in the States and elsewhere; they will have to base their figures upon the price of gasoline at the different ports of importation; and add to those prices the cost of transport, manipulation, stockage, taxes, etc., and finally a so-called "honest profit" for the marketer. When this has been done, doubtless after much discussion and bickering, the price at which gasoline may be sold will be announced. It is hoped in many quarters that this Bill will never be passed by the Chamber of Deputies, for it is regarded as certainly to do more harm than good.

It is a fact that at present many distributing companies are losing a great deal of money in France, more especially in Paris and the surrounding districts, where almost 25 per cent of the imported gasoline is consumed. They are also encountering difficulties in the North of France in the industrial regions where consumption is great and competition cut-throat, owing to the ever increasing number of small importers of petroleum products (less than 300 tons a month).

THE only way now left open to these distributing companies by which they can compensate their losses is to increase the price of gasoline in other districts, and if maximum prices are to be established by incompetent commissions, in which the State will most certainly always have the last word, the result will probably spell ruin for many. One cannot hope that these commissions will take the losses sustained in the North into consideration; on the contrary, they will base their figures upon prices reigning in those districts, because they are the ones in which consumption is the greatest.

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Canada's Position in the Oil Industry

Dominion Bureau of Statistics, Review of Petroleum Products For 1929 Reveals an Output of $100, 000, 000 From 15 Refineries and 10 Compounding Plants. 1930 Figures Not Yet Available

OUTPUT of petroleum products from Canadian plants in 1929 was valued at $99,408,314, an increase of $16.3 millions over 1928. This total included production valued at $98,384,180 from 15 refineries and an output worth $1,024,134 from 10 other concerns compounding lubricating oils and greases.

Four refineries were located in Ontario, four in Alberta, two in British Columbia, two in Quebec, and one in each of the provinces of Nova Scotia, Manitoba and Saskatchewan. Capital employed in the refining industry, represented by these 15 establishments, was placed at $69,887,267; the number of employees averaged 4,883 and the cost of materials was reported at $76,289,182. Gasoline production totaled 436,620,614 imperial gallons including 132,646,696 gallons made by the cracking process. Final sales of fuel and gas oils from the refineries amounted to 387,069,829 gallons; in addition to this the refiners used 61,629,931 gallons for fuel purposes. The quantity of fuel and gas oils made and used in the pressure cracking process was reported at 351,436,512 gallons.

The ten firms compounding lubricating oils and greases were located as follows: four in Quebec, five in Ontario, and one in British Columbia. Capital invested in these plants was reported at $1,373,192; the average number of employees was 95; cost of materials was reported at $572,757; and the value added by manufacturing was $451,377 to give the total sales value during 1929 of $1,024,134.

Considerable quantities of casinghead gasoline were imported into Canada during the year for use in blending with refinery gasoline; the amounts are shown in the import figures, but are *not* included with the figures of refinery output.

Table 4. — Consumption of Crude Oil in Petroleum Refineries in Canada, 1918-1829.

Year	Imperial gallons
1918	260,209,899
1919	301,006,553
1920	295,576,527
1921	373,469,418
1922	394,139,055
1923	408,810,739
1924	467,144,631
1925	445,115,694
1926	585,466,329
1927	716,369,890
1928	849,933,770
1929	1,072,828,496

Table 1.—Principal Statistics of the Petroleum Products Industry in Canada, 1925-1929.

Year	No. of plants	Capital employed	Average number of employees	Salaries and wages	Cost of materials at works	Selling value of products at works
		$		$	$	$
Petroleum refining:—						
1925	13	49,461,900	3,655	5,621,898	37,814,303	49,802,615
1926	17	56,476,449	3,698	5,782,589	50,783,871	70,570,240
1927	16	55,442,193	3,802	6,078,226	52,743,530	63,979,849
1928	16	55,811,418	4,252	6,803,234	57,033,185	82,448,392
1929	15	69,887,267	4,883	7,984,786	76,289,182	98,384,180
Lubricating oils and greases:—						
1925	8	1,118,649	83	153,148	446,721	959,812
1926	6	701,676	55	109,816	388,288	626,071
1927	7	693,371	54	110,000	316,391	548,971
1928	9	720,196	67	119,346	350,656	673,780
1929	10	1,373,192	95	168,839	572,757	1,024,134
TOTAL:						
1925	21	50,580,549	3,738	5,775,046	38,261,024	50,762,427
1926	23	57,178,125	3,753	5,892,399	51,172,159	71,196,311
1927	23	56,135,564	3,856	6,188,226	53,059,921	64,528,820
1928	25	56,531,614	4,319	6,922,580	57,383,841	83,122,172
1929	25	71,260,459	4,978	8,153,625	76,861,939	99,408,314

Table 2.—Materials Used in the Petroleum Products Industry in Canada, 1928 and 1929.

Materials	Unit of measure	1928 Quantity	1928 Cost at works $	1929 Quantity	1929 Cost at works $
Petroleum refining:					
Crude oil from Canadian wells (x)	Imp. gal.	20,324,814	2,112,314	37,338,402	4,026,272
Crude oil, imported	Imp. gal.	829,608,956	50,952,144	1,035,490,094	66,082,715
Imported fuel and gas oils for use in cracking process	Imp. gal.	.....	.....	440,475	18,270
Sulphuric acid (66 Be)	lb.	51,828,643	408,905	49,610,612	425,853
Sulphur	lb.	161,044	5,105	201,032	6,770
Caustic soda	lb.	4,345,466	159,803	6,699,874	243,319
Soda ash	lb.	381,196	8,023	404,185	9,315
Litharge	lb.	659,882	57,527	799,464	69,698
Fuller's earth	lb.	11,707,839	109,221	18,513,820	207,931
Compounding materials	—	.....	723,956	.....	676,102
Other materials	—	.....	127,099	.....	82,144
Shipping containers	—	.....	2,360,088	.....	2,440,793
	—				
Total	—	.....	57,033,185	.....	76,289,182
Fuel and gas oils made and used in pressure cracking process	Imp. gal.	284,510,884	.....	351,436,512	.....
Lubricating oils and greases:	—				
Total	—	.....	350,656	.....	572,757
	—				
GRAND TOTAL	—	.....	57,383,841	.....	76,861,939

(x) Includes Royalite naphtha.

Table 3.—Output of the Petroleum Products Industry in Canada, 1928 and 1929.

Products	Unit of measure	1928 Quantity	1928 Selling value at works $	1929 Quantity	1929 Selling value at works $
Petroleum refining:					
Made for sale:					
Gasoline (a) straight run	Imp. gal.	226,904,777	33,574,295	303,911,713	43,250,498
(b) by cracking process	Imp. gal.	117,175,542	18,647,134	132,646,696	20,242,805

(Continued on Page 156)

Canada's Refining Business Almost $100,000,0

OFFICIAL detailed figures of the 1930 operations of the various petroleum refineries in Canada may not be available for some months, but the 1929 statistics printed on the previous and following pages afford a very comprehensive conception of the rapidly growing importance of the Canadian refining industry. It is probable, however, that 1930 business will prove to have slightly exceeded the $100,000,000 of the year before. Pressure on editorial space has prevented earlier publication of the interesting 1929 statistics. Incidentally, the trade information bulletin, No. 723, Petroleum Refineries in Foreign Countries, 1930, issued by the U. S. Department of Commerce only give the 1927 and 1928 Canadian oil refinery data.

Canada now has 15 refineries and 10 lubricant compounding plants. Foremost among the refineries are those of the Imperial Oil Company, the great Canadian subsidiary of the Standard Oil Company of New Jersey, which in addition to producing, refining, transportation and marketing interests in Canada has great crude producing fields in Colombia and Peru.

Operated by Imperial Oil Limited in Canada, and illustrated on this page, the large plant at the bottom of the page is a section of the Sarnia refinery, which is the oldest and largest of Imperial's plants. Imperial began refining at Sarnia in 1897. Sarnia is situated on the St. Clair River just at the head of Lake St. Clair and was chosen as a refinery point because of its proximity to the Petrolia oil fields—in those days of some importance—and to the Mid-Continent fields in the United States because of its accessibility by water and rail.

Sarnia refinery is said to be one of the most diversified plants in operation. Practically every kind of petroleum product is turned out there. Its total capacity of crude oil amounts to 22,000 bbl. per day.

At the upper left is an aeroplane view of the Imperial refinery at Calgary, built in 1923, and which is situated about forty miles from the Turner Valley in Alberta from which it receives naphtha by pipe line. Its capacity is 5,000 bbl. per day.

The Regina refinery which has a capacity of 7,200 bbl. per day is shown in the upper right hand corner of the layout. The model town built by the

(Continued on Page 156)

At upper left at Montreal the Dartmouth the Rockies townsite to the skyline because of

0,000 Per Annum

Imperial Oil Refineries

upper left is Calgary refinery; below it the Imperial Oil refinery Montreal East. On the upper right is the Regina refinery with e Dartmouth refinery below it. Ioco refinery, which nestles in e Rockies on Burrard Inlet, is shown directly beneath, with Ioco wnsite to the right of it. At the bottom of these pages is part of e skyline of Sarnia, Imperial's first and largest refinery, which ecause of its extent defies all efforts to embrace it in one aeroplane view.

(Continued from Page 153)

Products	Unit of measure	1928 Quantity	1928 Selling value at works $	1929 Quantity	1929 Selling value at works $
Fuel and gas oils	Imp. gal.	309,185,187	12,543,505	387,069,829	15,586,290
V. M. & P. or solvent naphtha	Imp. gal.	4,949,743	643,350	7,257,910	974,348
Kerosene	Imp. gal.	55,939,530	7,335,353	49,297,417	6,870,711
Lubricating oils	Imp. gal.	19,022,749	3,340,097	22,900,238	3,943,418
Grease	lb.	14,439,030	266,590	17,042,195	316,848
Tar	lb.	.....	.....	1,032,500	8,260
Asphalt	Imp. gal.	22,326,606	2,016,630	35,233,347	2,688,579
Petroleum coke	ton	80,361	467,548	84,108	465,753
Wax and candles	lb.	15,872,946	599,335	10,776,352	581,886
Other products	—	.....	368,915	.....	258,115
Total for sale	—	.....	79,802,752	.....	95,143,509
Made for own use:					
Gasoline, straight run	Imp. gal.	49,542	7,413	62,205	8,813
Fuel and gas oils (except for cracking)	Imp. gal.	52,206,663	1,907,829	61,629,931	2,308,963
V. M. & P. or solvent naphtha	Imp. gal.	9,728	1,376	11,371	1,490
Kerosene	Imp. gal.	42,389	5,191	64,964	8,763
Lubricating oils	Imp. gal.	26,297	3,884	24,960	4,191
Petroleum coke	ton	15,547	93,882	25,408	140,230
Still gas	M cu. ft.	2,489,346	572,847	3,140,187	708,781
Acid sludge	—	.....	53,218	.....	53,909
Other products	—	.....		.....	5,184
Total for own use	—	.....	2,645,610	.....	3,240,671
Total Petroleum Refining	—	.....	82,448,392	.....	98,384,180
Fuel and gas oils made and used in pressure cracking process	Imp. gal.	284,510,884	.....	351,436,512	.....
Lubricating oils and greases:					
Lubricating oils	Imp. gal.	1,244,350	464,613	1,522,045	745,876
Lubricating greases	lb.	657,708	82,269	688,384	92,004
Soaps	lb.	.....	70,859	465,064	66,395
Other products	—	.....	56,039	.....	119,859
Total Lubricating Oils and Greases	—	.....	673,780	.....	1,024,134
GRAND TOTAL	—	.....	83,122,172	.....	99,408,314

Table 5.—Production, Imports, Exports (x) and Apparent Consumption of Certain Petroleum Products in Canada, 1920-1929.

Year	Production	Imports	Exports	Re-exports	Apparent consumption
Fuel and Gas Oils:—					
1920	Imp. gal. 96,462,792	122,929,391	[illegible],684,427	.....	216,707,656
1921	Imp. gal. 129,716,045	61,398,671	5,384,751	.....	185,729,965
1922	Imp. gal. 106,975,976	72,805,012	7,036,627	.....	172,744,361
1923	Imp. gal. 139,682,570	108,982,780	2,384,899	.....	246,280,451
1924	Imp. gal. 177,123,232	94,241,271	18,263,236	.....	253,104,267
1925	Imp. gal. 172,387,242	107,849,209	7,375,163	.....	272,861,288
1926	Imp. gal. 228,474,212	91,638,340	21,043,135	.....	299,069,417
1927	Imp. gal. 286,525,733	119,612,088	18,793,254	.....	387,344,567
1928	Imp. gal. 361,391,850	95,467,100	21,531,929	.....	435,327,021
1929	Imp. gal. 448,699,760	95,749,518	28,177,495	.....	516,271,783
Gasoline:—					
1920	Imp. gal. 86,193,664	8,515,545	160,433	214,634	94,334,133
1921	Imp. gal. 119,887,613	40,264,707	762,080	10,492	159,379,748
1922	Imp. gal. 143,959,893	42,112,248	1,976,244	27,620	184,068,277
1923	Imp. gal. 124,156,380	49,950,660	1,217,298	.....	172,889,742
1924	Imp. gal. 160,045,739	73,757,441	1,403,716	75,223	232,324,241
1925	Imp. gal. 164,670,072	83,927,751	1,568,855	42,594	246,986,374
1926	Imp. gal. 222,146,704	82,839,688	3,867,536	169,476	300,949,380
1927	Imp. gal. 258,549,724	108,168,328	2,463,379	327,293	363,927,380
1928	Imp. gal. 344,129,861	143,653,116	3,957,557	26,587	483,798,833
1929	Imp. gal. 436,620,614	175,151,570	4,669,078	168,438	606,934,668
Lubricating Oils:—					
1920	Imp. gal. 25,099,798	4,464,294	.....	.....	29,564,092
1921	Imp. gal. 24,246,320	5,040,456	.....	.....	29,286,776
1922	Imp. gal. 18,051,600	7,110,054	.....	.....	25,161,654
1923	Imp. gal. 17,121,896	8,196,682	.....	.....	25,318,579
1924	Imp. gal. 15,479,465	8,494,423	.....	.....	23,975,888
1925	Imp. gal. 15,789,852	8,445,738	.....	.....	24,235,590
1926	Imp. gal. 17,922,853	10,259,878	.....	.....	28,182,731
1927	Imp. gal. 19,591,297	12,537,957	.....	.....	32,129,254
1928	Imp. gal. 20,293,396	15,487,945	.....	.....	35,781,341
1929	Imp. gal. 24,447,243	17,404,194	.....	.....	41,851,437
Kerosene:—					
1920	Imp. gal. 54,155,655	14,971,509	1,243,335	.....	67,883,829
1921	Imp. gal. 59,082,790	10,544,281	1,466,422	.....	68,160,649
1922	Imp. gal. 76,521,560	3,673,234	1,471,947	.....	78,722,847
1923	Imp. gal. 67,396,674	4,127,146	1,450,051	.....	70,073,769
1924	Imp. gal. 61,308,467	5,431,393	1,525,427	.....	65,214,433
1925	Imp. gal. 45,026,459	5,256,661	1 508,686	.....	48,774,434
1926	Imp. gal. 58,502,190	4,842,452	1,584,645	.....	61,759,997
1927	Imp. gal. 54,316,079	4,028,966	1,759,838	.....	57,585,207
1928	Imp. gal. 55,981,919	3,964,692	1,297,081	.....	58,649,530
1929	Imp. gal. 49,362,381	4,523,347	1,367,241	1,578	52,516,909

(x) No allowance made for increases or decreases of stocks in storage at the refineries.

Directory

(a) PETROLEUM REFINERIES, 1929

Name	Location of Plant
Imperial Oil Refineries, Ltd.	Imperoyal, N. S.
Imperial Oil Refineries, Ltd.	Montreal, P. Q.
McColl-Frontenac Oil Company, Ltd.	Montreal, P. Q.
The British American Oil Refineries, Ltd.	Toronto, Ont.
Canadian Oil Refineries, Ltd	Petrolia, Ont.
Imperial Oil Refineries, Ltd.	Sarnia, Ont.
McColl Bros., Ltd.	Toronto, Ont.
North Star Oil, Ltd.	St. Boniface, Man.
Imperial Oil Refineries, Ltd.	Regina, Sask.
Associated Refineries, Ltd.	Wainwright, Alberta
Imperial Oil Refineries, Ltd.	Calgary, Alberta
The Maple Leaf Oil and Refining Co., Ltd.	Coutts, Alberta
Regal Oil and Refining Co., Ltd.	Calgary, Alberta
Imperial Oil Refineries, Ltd.	Ioco, B. C.
Vancouver Oil Co., Ltd.	Vancouver, B. C.

(a) LUBRICATING OILS AND GREASES, 1929

Jaffe Company, Ltd.	Montreal, P. Q.
Three in One Oil Company	Montreal, P. Q.
Economic Products, Ltd.	Outremont, P. Q.
Union Products	Montreal, P. Q.
The Ontario Lubricating Co., Ltd.	Hamilton, Ont.
Galena Signal Oil Company of Canada, Ltd.	Toronto, Ont.
Peterson Core Oil & Mfg. Co. of Canada	Hamilton, Ont.
Campbell Grease & Oil Co.	Toronto, Ont.
Warren Lubricating Co., Ltd.	Toronto, Ont.
Union Oil Company of Canada, Ltd.	Port Moody, B. C.

▼

Canada's Position in Oil Industry

(Continued from Page 154)

Company may be seen at the lower right of the picture with the community hall back of it. Being situated almost in the very centre of the Canadian prairies, Regina receives its crude oil supplies by rail.

Shown in the middle row of the layout, from left to right, are the Montreal, Que., Ioco, B. C., and Imperoyal, N. S., refineries. They were built following successful development work by Imperial's principal subsidiary, International Petroleum in South America. These plants process a considerable amount of South American crude oil. That of Montreal has a 30,000 bbl. capacity, and that in Nova Scotia, 17,000 bbl.

Table 6.—Consumption of Gasoline in Canada, 1929.* (x).

Province	Gallons
Prince Edward Island	2,478,181
Nova Scotia	17,284,990
New Brunswick	10,469,682
Quebec	77,054,230
Ontario	292,191,523
Manitoba	34,765,203
Saskatchewan	78,456,744
Alberta	50,208,495
British Columbia	38,316,179
CANADA	601,225,227

* (x) The above figures have been computed from data given in the reports of the provincial governments which show the total and net revenue received from gasoline taxes. The tax is collected on all gasoline sold and a rebate is given on purchases of gasoline for use in farm tractors, etc.

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For 1930 editorial content index see page 179.

D. C. Electric Drive for Portable Drilling

Diesel or Gasoline Power Sets at the Well Are Efficient for Places Where Central Power is Not Available. Electric Motor Feed Gives Automatic Weight Control. . . By W. A. Sawdon

Petroleum Engineer.

WHERE oil field power is developed in a central station, as in Burmah and Russia, and as is being developed in Venezuela, alternating current lends itself most readily to economical generation, distribution and utilization. Its relative low first-cost and simplicity are also factors. On the other hand, in opening up new fields in inaccessible places, portable direct-current outfits offer many advantages over alternating current for rotary drilling. Power for the generator may be Diesel, distillate or gasoline engines.

DURING the past few years attention has been concentrated on the rotary method of drilling in the United States, and the system is gradually extending to all oil fields of the world. Consequently all developments in rotary equipment and methods are being given the closest observation. Steam has been used for power to the greatest extent but many conditions—especially those encountered outside the United States—make the generation of steam difficult or uneconomical. The gas or gasoline engine has been used successfully as a direct prime mover in many instances, and electric motors also have been found very satisfactory where current has been available, such as the Burmah field. Some of the most recent designs, however, have employed the electric motor drive with provision for the generation of current at the well, since central-station electric power is frequently unavailable at the places where the drilling is to be done. These new developments will probably make rotary equipment more universal in its use, and will make possible the drilling of deep wells under any condition and in isolated districts where fuel and water supplies are difficult to obtain.

Direct current has many advantages over alternating current for the actual drilling work with the rotary system. The D. C. motor is more flexible than the A. C. type and offers a performance which approximates that of the steam engine. It has a high starting torque, it provides high efficiency under load and it accelerates smoothly. It has been deemed advisable, therefore, to employ direct current rather than alternating current when the generation is done directly at the wells to supply power for drilling operations; and two different forms of generating power have been tried out successfully in the California fields. One of these used Diesel engines to drive the generating unit, and the other employed gasoline engines using distillate for fuel. Both installations were made near Los Angeles to enable the oil companies, and the manufacturers of the equipment, to keep a close check on the performance and to collect valuable data on the operations.

The Diesel-Driven Power Plant

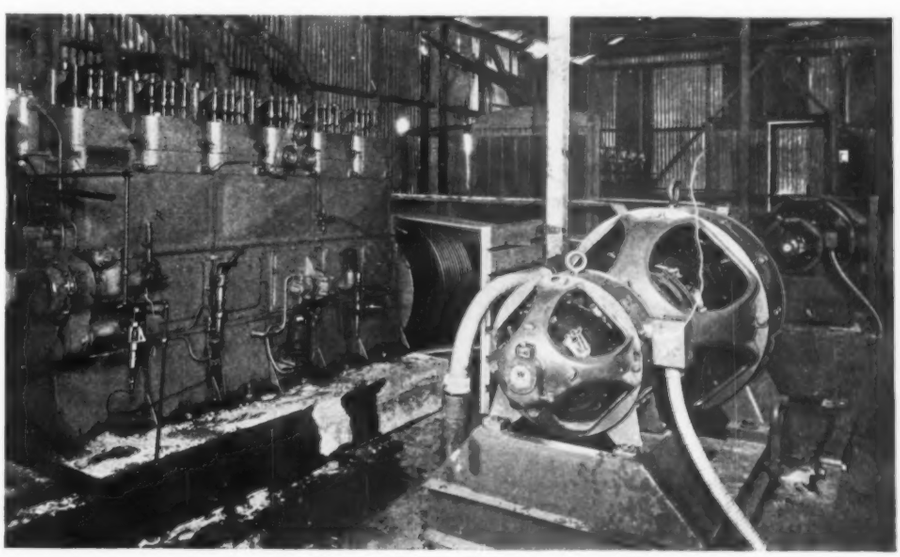
The Atlas-Imperial Diesel installation was located in the Inglewood field by the Standard Oil Company of California. The outfit was designed principally for use in foreign fields and on wildcats. The draw works is driven by a 125 h.p., 450 r.p.m., 250 volt, direct-current motor through a reduction gear. The mud pump is driven by a 125 h.p., 900 r.p.m., 250 volt, compound wound, direct current motor with the power transmitted through a V-belt drive.

The direct-current generating plant consists of two units. Each of these includes a 125 KW direct-current generator, which is powered through a V-belt drive by a 200 h.p., 6-cylinder Diesel engine. A 15 KW, 125 volt exciter is mounted on the same shaft as the generator, providing current for lights and auxiliary power. The generator is operated at a variable voltage, while the exciter voltage is constant. The generator speed is 1200 r.p.m. and the engine speed is 450 r.p.m.

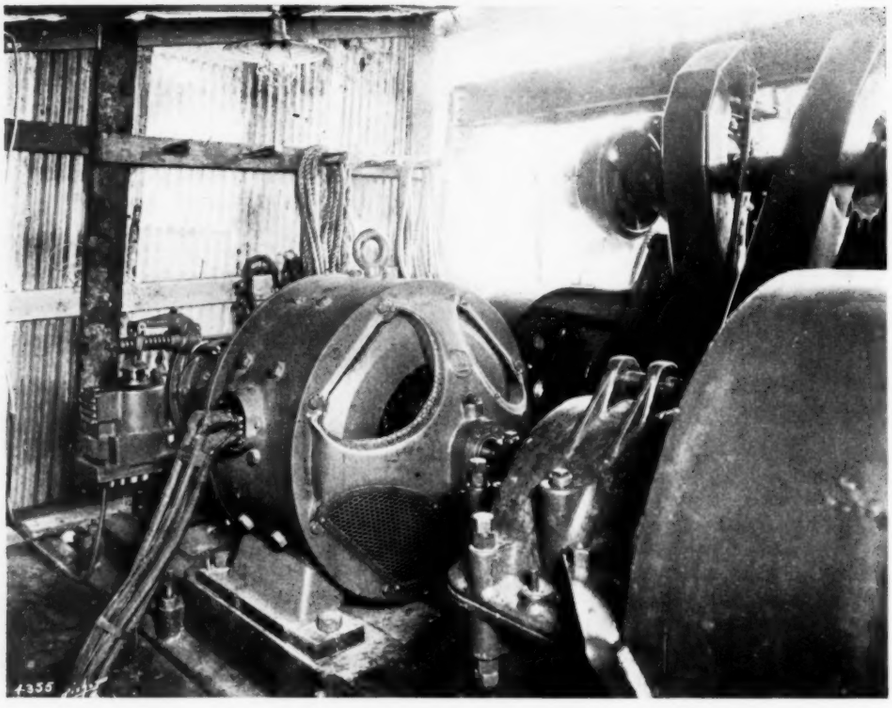
Push button control is provided at the drilling position and the generators can be placed in series by means of a switch. Double voltage and power can thus be given the drilling motor with the mud pump motor cut out. The motors are totally enclosed and of the spark proof type. For safety, the power plant and control panels were located in a house some distance from the rig.

The electrical equipment was developed by the Westinghouse Electric and Manufacturing Company and included several special features designed to meet operating conditions. Prime movers other than Diesel engines are adaptable to the installation.

Considerably more portability is obtained in the installation which employs



Two Diesel engines power the generator through V-belt drive.



The 125 h.p. drilling motor which derives its current from the two Diesel-generator sets.

gasoline engines for driving the generators, as Diesel engines of the same weight and speed as gasoline engines are not as generally available, although they now are obtainable from a few manufacturers. This portability is also applied to the drilling equipment itself, which consists of a motor, a draw works and a rotary table mounted on one steel frame. This assembly was made in the shop and transported on a truck to the location—a Union Oil Company well in the Montebello Field.

The draw works and rotary table are direct driven by a 100 h.p., shunt wound, direct-current motor with a maximum speed rating of 1500 r.p.m. It is equipped with a blower for its air circulation; and to provide against fire hazard it takes its supply of air from outside the rig. The motor is, of course, of the enclosed type.

The compact and self-contained draw works is particularly adaptable to this kind of installation. Its power is transmitted through a three-speed transmission of the selective type. The rotary table is standard, but is direct connected to the pinion instead of through a sprocket. A 60 h.p., 1700 r.p.m., shunt wound, direct current motor operates the mud pump through a V-belt drive.

The power plant is composed of two separate, but identical, units, each mounted on a truck trailer. Each unit consists of a generator, an exciter and a 165 h.p., 1200 r.p.m., Climax heavy-duty gasoline engine direct connected to them. This prime mover is a six cylinder, valve-in-head engine designed to burn natural gas, distillate, or gasoline. It is equipped with an electric starter and dual ignition, and was changed from standard to meet fuel requirements. An alteration in the governor was made to comply with operating conditions. The direct-current generator is of 250 volts, 300 amps. and 75 KW at a speed of 1000 r.p.m., while the exciter is rated at 11½ KW and is on the same shaft.

These two generating units are interconnected and can be run in parallel or separately. The power from both can be put into the drilling motor alone by means of a control at the driller's position. All other controls are, of course, placed at the same location together with starters, weight indicators and other instruments.

All the electrical equipment for this installation was provided by the General Electric Company, and its engineers made tests on the performance during the drilling of the first well. The equipment throughout is lighter than that used with the Diesel engines and requires less power for its operation. Conditions in the locations where it is desirable to use direct current for power will probably govern the selection of the prime mover for the power plant, while the drilling plans will influence the weight of equipment to be used.

Automatic Weight Control

Electric control of the weight being carried on the bit has also been recently developed, and has been used with success in the Ventura Avenue Field, California, by the Associated Oil Company. The necessity for drilling straight holes, especially at the depths now being penetrated, has naturally focussed attention on the weight kept on the bit while drilling, and the extensive use of weight indicators has proven the advantage which can be gained by controlling this weight. Manual control and other automatic weight controls have been used for several years, but a new principle has been exploited in this latest development.

Actually, this new device is a motor feed control and, although it requires electric power for its own operation, is adaptable with steam, gas engine, electric motor or any kind of prime mover. It is a separate unit and will generally be placed opposite the draw works. It can be installed at any time during the drilling of the well, and can be used for rigging up and as a standby for the draw works in case of emergency. The automatic control is, of course, disconnected for such service and manual control is then used.

The accompanying diagrammatic drawing illustrates the operation of the motor feed control. A hoist-drum chain connected to a worm-gear unit, a solenoid brake and a two-speed motor are mounted on one steel base. An automatic switch is placed near the motor and an electric control unit is located at any convenient

Union oil well at Montebello, Cal., being drilled with portable gasoline-electric unit.

place, probably off the derrick floor. The motor is a standard two-speed oil well induction motor of 35/15 h.p., 1200/1600 r.p.m., 60 cycles, 440 volts.

The dead line is converted to a live line by a few turns on the hoist drum. It will be under tension as the well is being drilled and will tend to rotate the drum. Through the chain drive, this tendency is transmitted to the worm gear which develops an end thrust against the diaphragm indicated in the drawing. The diaphragm then exerts a pressure on the fluid contained in the pipe leading to the automatic switch which consists mainly of a mercury U-tube. An air pressure is placed on the one column of the U-tube to oppose this fluid pressure on the other, and the two opposing pressures are so established as to keep the mercury columns in equilibrium when the desired weight is on the bit.

A change in weight will occur as drilling progresses. As the weight on the bit decreases, it will increase the tension in the line extending from the crown block to the hoist drum; and this, in turn, increases the thrust on the worm gear and the pressure on the diaphragm. This pressure, transmitted through the fluid piping, forces the mercury down in the left column and up in the right column until the latter makes a contact with the wire. When this occurs, the motor starts rotating and feeds the bit down.

When something occurs to increase the weight on the bit, the tension on the line decreases and relieves the worm-gear thrust. This decreases the pressure in the fluid piping and permits the greater air pressure to force the mercury down in the right mercury column and up in the left until contact is there made with the wire. This contact causes the motor to start rotating in reverse and to retrieve the line. The motor continues running in either direction only as long as the desired weight is not maintained, since the mercury regains equilibrium as soon as the weight for which the pressures are set is regained. The mercury losing contact with the wire then disconnects the circuit.

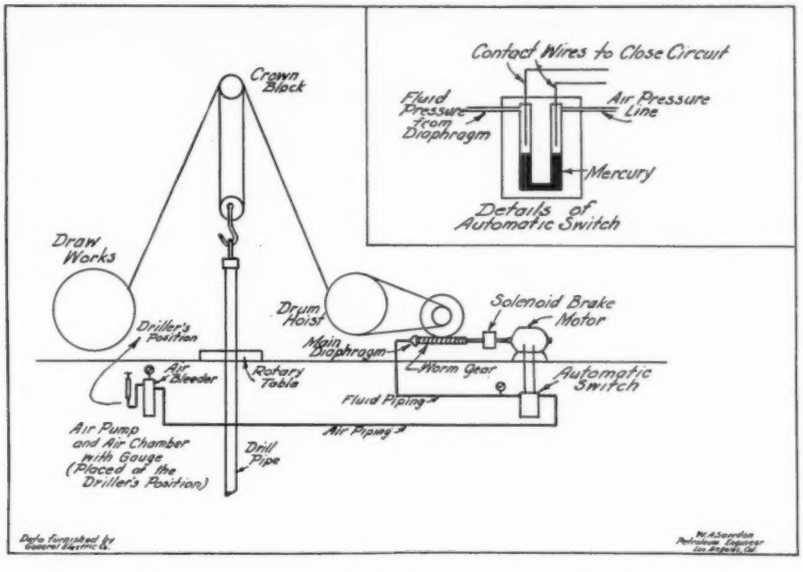
All hoisting is done on high speed whether it is automatically or manually controlled; and the bit is always fed down on low speed. The mercury switch is extremely sensitive and keeps the weight within a close limit. It does not, however, react to momentary variations such as those caused by the mere bouncing of the bit; and it feeds or retrieves only when the average continuous pressure at the bottom of the hole changes.

There is another diaphragm between the main diaphragm and the mercury switch which acts as a limiting agent and also as a separation for the two kinds of fluid used in the piping. Water is used in the line between the two diaphragms and tetrachloride is used from the limiting diaphragm to the mercury column.

As shown in the drawing, the air pressure is regulated at the drilling position where all the controls are located. The weight setting is changed by a few strokes of the pump to increase the air pressure or by bleeding off at the valve to decrease it. A hand lever switch is also placed here and by means of this the motor feed control is placed in service as an automatic weight controller, as a manually controlled hoist or is cut out altogether.

Gauges are provided on the pressure lines and are read in the same way as those on weight indicators. They take the place of weight indicators, when casing is being run. The drum is unclutched at this time, and a crank provided for the purpose is used by hand control with a jerk line for setting up joints.

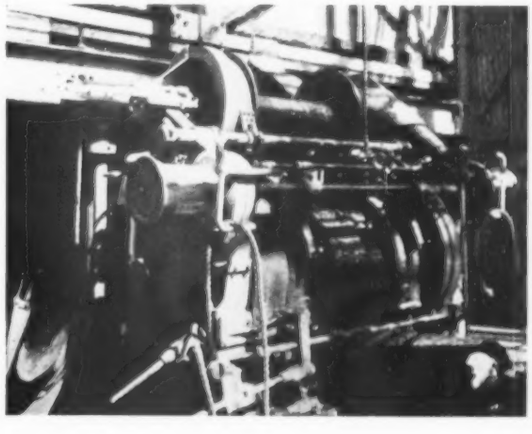
The drilling operation can be stopped or the bit picked up by interrupting the automatic feed at any time. In the case of twist-off, the control starts the pipe out of the hole automatically since the tension in the line from the crown block to the hoist drum is decreased. Bad fishing jobs may be prevented by this. In fishing, the device can be used to advantage by setting a reaction pressure of any desired amount above to balance pressure. The hoisting will then be limited to the pull desired.



Operation of motor feed weight control with mercury switch in detail. Drawing is diagrammatic and distorted for the purpose of clarity.

The draw works is mounted on the same frame as the D. C. motor, making a portable unit.

Portability of the gasoline-electric unit is clearly depicted.



World Crude Oil Production Figures—Offi

ONCE again WORLD PETROLEUM publishes official figures of the previous year's crude oil production of the world ahead of any other medium. Compared with 1929, there has been a total drop in world production of but 70,432,912 bbl., and the detailed returns make very interesting comparisons with the year before. For the latter purpose we publish 1928 totals as well as those of 1929 and 1930.

The 1930 month by month totals for every country in the world will show that in a few cases it has been necessary to be content with approximate figures, or estimates, for some of the months or for the year's totals; but these may be regarded as being reasonably close to the actual production. In some instances it is possible that revised figures may be issued at a later date as per previous official practice.

The greatest curtailment of all has been shown by the U. S., which reduced its output by 109,893,000 bbl., the aggregate of all the other countries ex-

WORLD CRUDE-OIL PRODUCTION FIGURES 1930, 1929 and 1928

	Year 1930	Year 1929	Year 1928
TOTAL PRODUCTION	1,408,048,912 bbl.	1,478,481,781* bbl.	1,322,370,000 bbl.
UNITED STATES	896,694,000 bbl.	1,006,587,000 bbl.	901,474,000 bbl.
ALL OTHER COUNTRIES	511,354,912 bbl.	471,894,781*bbl.	420,896,000 bbl.
VENEZUELA	141,652,832 bbl.	138,914,552 bbl.	106,000,000 bbl.
RUSSIA	129,955,417 bbl.	98,148,890 bbl.	87,800,000 bbl.
PERSIA	43,549,323 bbl.	42,500,000 bbl.	42,080,000 bbl.
ROUMANIA	39,876,589 bbl.	33,568,200*bbl.	30,600,000 bbl.
MEXICO	39,529,639 bbl.	44,687,879 bbl.	50,150,000 bbl.
DUTCH EAST INDIES	37,100,000 bbl.	36,100,000 bbl.	28,500,000 bbl.
COLOMBIA	20,343,176 bbl.	20,295,925*bbl.	19,900,000 bbl.
PERU	12,445,888 bbl.	12,460,000 bbl.	11,970,000 bbl.
TRINIDAD	9,419,804 bbl.	8,710,052 bbl.	7,750,000 bbl.
ARGENTINA	9,007,768 bbl.	9,184,554 bbl.	9,100,000 bbl.
INDIA—BRITISH	8,100,000 bbl.	8,286,000[1] bbl.	8,300,000[2] bbl.
SARAWAK	5,251,441 bbl.	5,234,873 bbl.	5,290,000 bbl.
POLAND	4,645,550 bbl.	4,731,104 bbl.	5,530,000 bbl.
JAPAN AND TAIWAN	2,250,000 bbl.	2,010,000 bbl.	1,800,000 bbl.
EGYPT	1,977,660 bbl.	1,868,314 bbl.	1,840,000 bbl.
SAKHALIN (Russian)	(included with Russia)	1,076,000 bbl.	509,000 bbl.
ECUADOR	1,584,813 bbl.	997,638 bbl.	1,090,000 bbl.
CANADA	1,535,827 bbl.	1,132,800 bbl.	618,000 bbl.
GERMANY	1,209,185 bbl.	728,000 bbl.	683,000 bbl.
IRAQ	1,200,000 bbl.	532,000 bbl.	650,000 bbl.
FRANCE	500,000 bbl.	497,000 bbl.	520,000 bbl.
CZECHO-SLOVAKIA	155,000 bbl.	161,000 bbl.	150,000 bbl.
OTHERS	65,000 bbl.	70,000 bbl.	66,000 bbl.

* Corrected from figures published in February, 1930, WORLD PETROLEUM.
1 and 2—Returns have also been given as 8,366,049 bbl. and 8,741,247 bbl. respectively.

1930 MONTH BY MONTH

In U. S. Barrels, Conversion Basis:—7 bbl. per Ton Where Official Returns

	January	February	March	April	May	June
UNITED STATES	79,721,000	74,243,000	77,600,000	77,191,000	80,342,000	76,929,000
VENEZUELA	11,893,973	11,153,952	12,467,438	11,131,687	11,641,966	11,648,847
RUSSIA (including Russian production in Sakahlin)	8,852,220	7,992,600	9,632,644	10,190,019	10,932,005	10,437,840
PERSIA (Anglo-Persian Co.)	2,743,846	2,477,020	3,804,990	4,173,379	4,641,301	4,043,676
ROUMANIA	3,150,000	3,010,000	3,360,000	3,570,000	3,710,000	‡3,640,000
MEXICO	3,718,667	3,270,661	3,491,000	3,319,303	3,350,935	3,287,054
DUTCH EAST INDIES	§3,069,596	§3,334,450	§3,069,595	§3,069,595	§3,069,595	§3,069,595
COLOMBIA	1,721,820	1,520,541	1,778,202	1,645,242	1,719,138	1,695,845
PERU	960,000	1,000,476	1,098,635	1,100,735	1,124,720	1,055,380
TRINIDAD	734,615	658,683	815,339	790,568	779,257	766,067
ARGENTINE	§841,683	§817,833	§687,107	§677,193	§720,274	§703,379
BRITISH INDIA	*675,323	*675,323	*675,323	*675,323	*675,323	*675,323
SARAWAK	‡445,700	‡395,153	‡443,521	‡408,126	‡449,538	‡448,448
POLAND	390,600	340,200	378,000	375,900	382,200	373,100
JAPAN & TAIWAN (including Japanese production in Sakahlin)	*187,500	*187,500	*187,500	*187,500	*187,500	*187,500
EGYPT	157,939	146,888	166,613	151,461	159,163	156,841
ECUADOR	115,572	114,798	142,817	139,486	137,928	129,762
CANADA	100,496	89,961	119,350	102,335	106,339	121,403
GERMANY	80,934	69,762	77,056	111,200	102,753	98,525
IRAQ	*100,000	*100,000	*100,000	*100,000	*100,000	*100,000
OTHERS (France, Italy, Czecho-Slovakia, etc.)	*60,000	*60,000	*60,000	*60,000	*60,000	*60,000
Total	119,721,484	111,658,801	120,155,130	119,170,052	124,391,935	119,627,585

§Approximate (Royal Dutch figures for total). †Based on official monthly totals; final official total is 39,529,901 bbl. Sarawak excluded. *Estimate. ‡U. S. Dept. of Commerce Figures.

"Official" means government figures. Where a figure is not official it is so indicated.

For uniformity the conversion figures of seven barrels per ton has been used. Consequently the totals for several countries producing light oil, and for which official returns are given in metric tons, will actually be higher than shown above.

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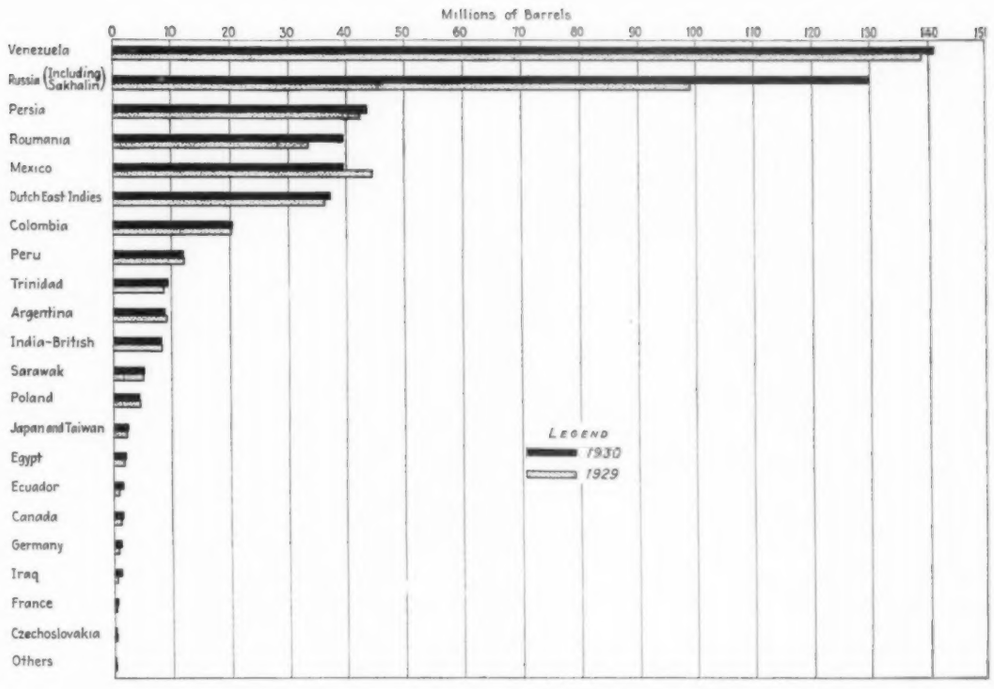
ceeding that of 1929. Of the seven other important producing countries having an output exceeding 20,000,000 bbl. per year each, six show an increase and one, namely Mexico, had a drop of 5,158,240 bbl. The order in greatest volume of production, namely, United States, Venezuela, and Russia has not changed.

Owing to curtailment not having started until late in 1930, Venezuela shows an increase of 2,738,280 bbl. Russia shows the greatest increase, apparently being 31,806,527 bbl. higher than 1929, but in 1929 Sakahlin production was listed separately. This year Sakahlin is included with the Russian figures, so that the actual gain is 30,730,527 bbl.

Persia shows a gain of 1,049,323 bbl., and this would have been considerably higher were it not for the fact it is the policy of the Anglo-Persian Oil Company to return the fuel-oil and gas back into the ground after the crude has been topped at the refinery. Persia now takes the fourth place, instead of Mexico. Roumania also jumps ahead of Mexico by showing an increase of 6,308,389 bbl., and now occupies the fifth position with Mexico running a close sixth.



Crude Oil Production, 1930 and 1929, of all countries outside of the United States compared. The ratio between the U. S. and any other country is too great to include a comparison in the diagram. The ratio between the U. S. and all other countries is 63.68% and 36.32%, respectively.

FIGURES

Were Given in Tons or Metric Tons.

July	August	September	October	November	December	Total for 1930
76,554,000	74,853,000	70,977,000	72,696,000	68,174,000	67,414,000	896,694,000
11,657,926	12,875,338	12,054,875	12,141,108	11,485,722	§11,500,000	141,652,832
11,330,774	11,673,949	11,700,395	12,250,504	12,262,467	12,700,000	129,955,417
3,841,600	3,413,900	3,572,520	4,081,686	3,647,405	3,108,000	43,549,323
3,760,958	2,942,289	3,045,000	2,713,312	2,975,000	*4,000,000	39,876,589
3,436,516	3,448,543	3,242,929	3,147,353	2,894,759	2,921,919	†39,529,639
§3,069,595	§3,069,595	§3,069,596	§3,069,596	§3,069,596	§3,069,596	§37,100,000
1,761,820	1,747,202	1,638,926	1,725,809	1,692,264	1,696,367	20,343,176
1,044,470	1,158,570	973,089	985,665	958,881	985,267	12,445,888
772,319	793,666	837,347	884,725	794,887	792,331	9,419,804
§754,133	§769,009	725,847	758,209	774,368	778,733	9,007,768
*675,323	695,952	650,818	*675,323	*675,323	*675,323	*8,100,000
‡456,227	‡450,628	‡428,138	‡445,829	‡428,689	‡451,444	‡5,251,441
392,700	403,200	394,100	414,400	398,650	402,500	4,645,550
*187,500	*187,500	*187,500	*187,500	*187,500	*187,500	*2,250,000
181,360	175,105	161,266	176,379	170,646	‡173,999	‡1,977,660
*135,000	137,642	127,189	133,103	131,754	*139,762	†1,584,813
122,862	136,056	139,947	171,352	160,726	*165,000	1,535,827
83,104	99,582	113,911	141,414	118,944	112,000	1,209,185
*100,000	*100,000	*100,000	*100,000	*100,000	*100,000	*1,200,000
*60,000	*60,000	*60,000	*60,000	*60,000	*60,000	*720,000
120,378,217	119,190,726	114,200,393	116,959,267	111,161,581	111,433,741	1,408,048,912

The Dutch East Indies, though showing 1,000,000 bbl. greater production, has not moved from the seventh place in the world's output. Colombia also retains her position as the eighth largest producer. Her production for 1930 shows only a slight increase over the previous year, namely 47,251 bbl.

Of the countries producing less than 2,000,000 bbl. per year, Germany, Ecuador and Iraq show the greatest gains. Iraq oil, however, while it affects petroleum imported into that country does not yet affect world markets, because its present production is used entirely within the country. This situation is not likely to change for two years as far as Iraq is concerned. After that period it is possible that Iraq will jump to the 12,000,000 or 20,000,000 bbl. class.

The percentage of production for the United States is 63.68% of the world's total, and that over all other countries together 36.32%, compared with 68.08% and 31.92% respectively in 1929.

U. S. Soviet Russia Production Review

An executive committee of the highest prerogative has investigated the oil industries of the country, and has passed a resolution that the main reasons of the arrears of the industry and its slow tempo of development are to be found in the rather conspicuous backwardness of the Russian industrial plants which build the oil supply equipment. In view of the fact that oil is to be considered as a most important product for the industrialization of the country as well as a means to maintain the country's export balances, it was resolved to instruct the Supreme Council of National Economy to take the necessary steps and measures in order that the quotas of 1931 be fulfilled for the manufacture of drilling and casing pipe, drilling machinery and all other equipment for the oil industry.

It has been estimated that the requirements of the oil industry during 1931 will consist of 215 rotary drilling machines, 65 Kapelushnikoff turbodrill sets, 400 pumping plants, 350 swivel sets and various other equipment at a cost of approximately 42,000,000 roubles, and approximately 48,000,000 roubles will be spent for drilling and casing pipe. The requirements of refinery equipment and plants during 1931 and 1932 are estimated at a cost of 52,000,000 roubles, of which 33,000,000 roubles are set aside as expenditures for 1931, to comprise: 30 pipe stills, 20 cracking units, 3 treating plants for gasoline produced by cracking, 4 carbon black plants and 65 shell still batteries.

Apart from the above, the following new and replacement installations will be required in 1931: 320 boilers of all kinds of design and type and heating surfaces, of which 144 are to be of Lancashire type and 44 Shukhoff type, 270 Diesel engines up to 1000 HP., 58 steam engines, 205 compressors, 1,970 pumps of various types, all of which will be built in Russia.

It has further been found that the oil industry's railroads have become partly deteriorated and have reached a state of decay, and it will therefore be necessary in 1931 to undertake a fundamental reconstruction of the same with the following requirements: 34 steam locomotives, 30 Diesel locomotives, 445 freight cars and 1,000 sliding and side-dumping cars, etc. The committee has also called the attention of the State Planning Institute to the growing demands of the oil industry for electrical energy and has advised the expenditure of 18,000,000 roubles for the following new installations: 8 turbogenerators with a capacity of 100,000 kw., 82 generators of various capacities up to 100 kw. and over, 307 electrical drilling aggregates with arrangements for speed control, 3,386 electric motors of various types and capacities, and 280 transformers up to 2,000 KVA. and over.

Capital Investment—1931

In order to wipe out all the arrears of the past and to comply with the plans for 1931, a total sum of 455,000,000 roubles has been appropriated for expenditures in the oil industry at large. It has been acknowledged that the drilling program of 1931 will be of particular importance, and for the carrying through the program, which calls for the drilling of 648,000 meters at a cost of 133.9 roubles (based upon experience of the past), a total of 86,800,000 roubles has been allotted for the item. The grand total, including exploration drilling, drilling equipment, etc., will be 183,200,000 roubles or 40 per cent of the total appropriations for the oil industry. About 300 rotary drilling sets will be installed, half of which will be replacements; 65 turbine drilling units (Kapelushnikoff system) will also be installed.

A sum of 15,000,000 roubles has been allotted for production (25,000,000 tons in 1931). This will cover the expenditure for equipment and will be allotted to the individual Trusts as follows: 10,500,000 roubles to Azneft; 1,700,000 roubles to Grozneft; 600,000 roubles to Maikopneft; 800,000 roubles to Embaneft; 500,000 roubles to Sakhalinneft; 500,000 roubles to Middle Asianeft; 200,000 roubles to Gruzneft and 200,000 roubles to Uralneft. Expenditures for the production of gas will be allotted to Grozneft and Maikopneft only. The Grozneft will require for the purpose a sum of 500,000 roubles, whereas Maikop has to build two gasoline absorption plants with a capacity of 500 tons per day (approximately 4,000 bbl.) each; two carbon black plants will also be installed in the Maikop region.

Second in importance after drilling comes the appropriation for building of refineries, with 115,850,000 roubles. This item includes the completion of 37 refinery units, part of which are already under construction. They consist of the following:

Azneft

2 Graver-type pipe stills, to be of domestic construction.

Azneft Trust's new refining plant at Baku, Transcaucasia

1-9 Shell still batteries, 400,000 tons capacity per year.
2 Winkler-Koch type cracking units, 150,000 tons each per year.
5 Badger-type pipe stills, 200,000 tons each per year.
5 Badger-type gasoline-kerosene stills, domestic (Russian) construction, 420,000 tons capacity each per year.
2 Winkler-Koch type cracking units, domestic construction, and 20 coke stills.

The Azneft will thus have a kerosene capacity of 1,200,000 tons, which means an increase of 800,000 tons during 1931. Its capacity for lubricating oil production will be increased during 1931 by 250,000 tons to 1,000,000 tons.

Grozneft

1 Badger pipe still (under construction), 1,100,000 tons capacity per year.
4 Winkler-Koch cracking units, 150,000 tons each per year.
1 New pipe still for deep refining, 440,000 tons per year.
2 Pipe stills, Jorgenson system, domestic construction, 400,000 tons capacity each per year.
4 Winkler-Koch type cracking units, domestic construction, 150,000 tons capacity each per year and 21 coke shells.
1 Benzine-kerosene pipe still at Krasnodar, 440,000 tons per year.
1 Gasoline pipe still at Krasnodar, 220,000 tons per year.

It is further planned to begin with the erection of a refinery at Chabarovsk of 200,000 tons capacity for Sakhalinneft, to be in operation around April, 1932. Another refinery for Middle Asianeft at Kokand is being planned to be ready by January, 1932.

A NUMBER of enlargements of power plants are to be made, among which are the Azneft Krassin plant, which will be enlarged to 66,000 kw. The Red Star plant to 124,000 kw. Both items will involve the expenditure of 13,000,000 to 15,000,000 roubles. The Grozneft will enlarge its power plant to 25,000 kw. at a cost of 2,500,000 roubles and the new power plant at Sakhalinneft will involve an expenditure of 2,500,000 roubles.

Neftetorg, which is the sales organization of the Soviet Oil Industries, will carry a program of expenditures for terminals and tank farms, etc., to the extent of 25,000,000 roubles.

Table I shows the total itemized expenditure program of the oil industry for 1931.

THE total export of petroleum products from Russia during the fiscal year 1929-30—October 1, 1929, to September 30, 1930—amounted to 4,626,000 tons, or approximately 37,000,000 bbl. This is about 8,000,000 bbl. more than last year's export and about 22,300,000 bbl.

Table I

Soviet Russia's Petroleum Budget—1931

	Amount in Roubles	% of Total
1—Drilling, exploring, geology, etc. and equipment for production	198,335,000	43.6
2—Refining and equipment	115,850,000	25.3
3—Gas Industry	5,950,000	1.3
4—Electrification	23,100,000	5.3
5—Terminals, tanks, etc.	25,000,000	5.3
6—Housing	27,485 000	6.0
7—Instruction of Personnel	7,750,000	1.7
8—All other expenses including fire prevention, safety devices, etc.	51,530,000	11.5
Total	455,000.000	100.0

more than the export from pre-war Russia during 1904, which then was its peak year. The increase over 1928-29 amounts to 27.7% and over 1904 to 152%. Of the above amount 3,046,000 tons, or 65.8%, were exported from the port of Batoum in the Black Sea.

FIGURES for October, the first month of the "shock term," for the entire oil industry of Soviet Russia, show that the quotas were not fulfilled by any of the Trusts, with the exception of Grozneft and Uzbekneft, both of which slightly exceeded their operating quota. The average ratio of completion of the plan for the month amounts to 97.1% for production, 99.6% for refining operations and 87.1% for drilling. The Azneft Oil Trust, whose quota for October was only 92.8% of completion, shows another breakdown of production, not only at Surakhany but also in almost all other of its producing areas. The Lenin Group of fields attained but 94% of the month's schedule of production, Surakhany 97.6%, Bibi-Eibat 94%, and Bingadi 91%. It is to be assumed that part of the arrears are due to a decrease in gushing production of the Azneft fields during October, as the figure at the beginning of the month was 26.4% and at the end of the month the ratio decreased to 24.6% of the total.

In Table II are given the official figures for October, 1930, in tons (1 ton = 7.25 bbl. of 42 gallons).

THE complete official figures of oil products in the U. S. S. R. for the period between October 1, 1929-August 31, 1930, consist of exports as well as internal consumption, as shown in Table IV, for eleven months of the fiscal year, stating also in percent the increase over the same period of last year.

PRELIMINARY figures of internal consumption of petroleum products in Soviet Russia have become available for the fiscal year 1929-30. The total consumption has grown from 7,630,000 tons in 1928-29 to 9,973,000 tons in 1929-30. The increase is 30.7% as against 28.5% of the plan for the year. Table III shows the consumption figures for both years by individual products (in metric tons).

Table III

Production in the Last Two Years

(Figures in tons: 1 ton = 7.25 bbl. of 42 U. S. gals.)

	1928/29	1929/30	Increase %
Diesel & fuel oil	5,531,000	7,019,000	26.9
Kerosene	1,457,000	1,984,000	36.2
Lubricating oil & special oil prods.	297,000	509,000	71.3
Heavy lub. oil	219,000	259,000	18.0
Gasoline	127,000	2 2,000	58.0
Total	7,631,000	9,973,000	30.7

Of special interest is the growth of consumption of gasoline as well as of lubricating oils, which is to be explained by the rapid mechanization of agriculture and modernization of the industries. The item of fuel oil represents a consumption of 878,000 tons of Diesel and gas oil with an increase of 17.5% over last year. The consumption of fuel oil (grade C) amounted to 6,141,000 tons against 4,784,000 tons during the last year. The increase amounts to 28.4% against 22.8 as scheduled.

Table II—Production in October

	Production		Refining		Drilling	
	Quantity	% of Plan	Quantity	%	Distance in Meters	%
Azneft	952,200	92.8	794,400	94.1	36,400	87.7
Grozneft	732,100	101.1	719,200	101.4	9,200	83.3
Embaneft	29,000	97.6	21,200	103.5	3,700	84.8
Maikopneft	14,500	76.5	11,000	100.0	800	137.8
Uralneft	400	21.9	.....	.....	1,300	107.6
Sakhalinneft	13,500	84.1	.....	.....	1,100	74.4
Uzbekneft	5,400	134.5	3,800	109.6	800	25.4
Total	1,747,100	97.1	1,549,006	99.6	53,300	87.1

Table IV—Production from October 1, 1929 — August 31, 1930
Production from October 1, 1929-August 31, 1930
Figures in tons: 1 ton = 7.25 bbl. of 42 U. S. gallons

	Internal Consumption		Export	
	Quantity	Increase %	Quantity	Increase %
Motor Fuel & Gas Oil	795,642	19.0	306,657	65.4
Heavy Fuel	5,600,335	32.1	1,642,232	39.4
	6,395,977	30.3	1,948,889	43.0
Heavy Lubricating oil	232,560	20.7	.....	....
Gasoline-Ligroin	255,460	19.5	1,228,566	36.5
Kerosene	1,910,517	35.8	733,177	4.8
Solar oil	18,588	2.7	63,258	.6
Lubricating oil	103,216	22.8	165,079	2.9
Special oils	141,163	70.4	7,411	....
All others	123,868	70.8	7,881	....
Total	9,181,349	33.4	4,154,261	30.0

THE total consumption of kerosene represents 557,000 tons used as tractor fuel as against 257,000 tons of last year. The increase is 116.5%. The balance of 1,427,000 represents illuminating oil. The increase over last year is 19.0%, and it must be stated that the demand for this product exceeded the supply to a great extent and the execution of orders were taken care of in terms of limited quotas. Under lubricating oils were 103,000 tons of machine oil with an increase over last year of 21.2%, which is 6.1% under the quota for the year. All special oil products show 203,000 tons against 142,000 tons of last year, the increase being 44.4%.

NOVEMBER, 1930, the second month of the "shock term" for the industries of Soviet Russia shows the following statistics of the Oil Industry:

Table V—Production, Refining and Drilling in November, 1930

	Production		Refining		Drilling	
	(tons)	% Pl.	(tons)	% Pl.	(metres)	% Pl.
Azneft	952,000	91.2	712,600	93.6	37,300	94.5
Grozneft	736,600	101.5	639,200	93.8	9,600	90.3
Maikop	18,900	125.9	17,200	95.4	2,500	129.8
Embaneft	27,700	94.4	26,900	146.4	4,500	120.8
Sakhalinneft	10,000	66.7	.....	....	.....	....
Uralneft	500	29.8	.....	....	1,500	63.9
Middle Asianeft	6,300	90.6	3,900	106.4	700	42.3
Total	1,751,800	95.4	1,399,800	94.4	56,100	93.9

The average per day for production has increased from 56,500 tons during October to 58,400 tons in November (+3.4 per cent) and in the case of drilling from 1,700 metres to 1,870 metres (+10 per cent). The daily average for refining operations has dropped from 48,000 tons per day in October to 46,700 tons in November. The calendar plans for the month were not fulfilled as production reached only 95.4 per cent of the plan against 98.7 per cent in October. Refining operations during November came to 94.4 per cent of the schedule, as against 97.6 per cent while drilling in November amounts to 93 per cent of the quota as against 84.5 per cent in October. Generally speaking the arrears of the quotas have deepened considerably as the leftovers for December in order to live up to the plan are 1,842,000 tons in production and 1,750,000 tons in refining.

Operations of the Azneft Oil Trust decreased during November to 91.2 per cent from 92.8 per cent in October, and the individual fields production has slowed down, as follows: Surakany from 97.6 per cent in October to 87.3 per cent in November; Bibi Eibat from 94.0 per cent to 91.2 per cent, but the Leningroup field increased from 94 per cent in October to 95.3 per cent in November.

Program for 1931

THE total production of crude oil and gas in Soviet Russia for 1931 has been fixed at not less than 25,504,000 tons (approximately 175,000,000 bbl.). It is with a view of meeting the growing demand of the internal markets as well as of the necessity of increasing the export balances that Soviet Russia has to increase production at the rate of 35% per year, and it there sees itself compelled to produce, by 1933, the last year of the five-years plan, not less than 46,000,000 tons of crude oil (approximately 331,000,000 bbl.) or 6,000,000 tons more than planned before. The Supreme Council of National Industries of Soviet Russia has therefore ordered the Union of Oil & Gas Industries to increase production during 1931 by 34.3% compared with 1930. The total increase, including gas, will amount to 35.2% and the following working plan has been presented to the individual oil trusts:

		Quantity (Tons)	Increase in % over last year
Azneft	not less than	13,650,000	28.8
Grozneft	"	8,900,000	30.5
Maikopneft	"	1,200,000	19.5
Embaneft	"	400,000	11.4
Sakhalinneft	"	260,000	132.7
Middle Asianeft (formerly Uzbekneft)	"	100,000	118.5

IT has been calculated that in order to successfully accomplish this ambitious program it will be necessary to drill at least 750,000 meters in productive drilling and another 150,000 meters in re-exploring the old fields. It is, however, to be assumed that lack of equipment, organization and transport facilities as well as the inadequacy of the preliminary surveys, may reduce the actual accomplishment to 800,000 meters.

It has further been ordered that of the above gross production of crude oil during 1931, a total of 22,533,000 tons shall be run to stills, i. e., 91.4% of the crude has to be refined.

The total capacity of all refineries in Soviet Russia on October 1, 1930, amounted to 18,000,000 tons, which had to be increased by new construction to 20,700,000 tons by January 1, 1931, and it is contemplated to bring up the total capacity of the plants to 26,800,000 tons by January 1, 1932.

UNDER this plan the capacity of the Azneft Oil Trust to produce lubricating oil was to be increased from 1,600,000 tons as of October 1, 1930, to 2,040,000 tons by January, 1931, and to 3,040,000 tons by January, 1932. No plans were made for the increase of the lubricating-oil production of the Grozneft Oil Trust or of the Neftezavodi (plants of the inner regions). It is, however, contemplated to increase materially the cracking capacity of the Grozny Trust. The plan calls for an increase from the three cracking units, which were in operation on October 1, 1930, to 15 units by January, 1931 (capacity 2,020,000 tons), and to 28 units with a capacity of 3,900,000 tons by January, 1932. The Council for Labor and Defense has therefore ordered the Supreme Council of National Industries to reinforce the equipment of the machine industries and plants of Soviet Russia with a view of increasing the output of equipment and appliances for the petroleum industry. The domestic machine industries will be called upon to build 20 cracking plants and 26 pipe stills during 1931 and sixty cracking units as well as 40 pipe stills during 1932.

J. WEGRIN.

U. S. PRODUCTION REVIEW

U. S. Production Review

	Daily Production bbl.	Daily runs to Stills bbl.	Gasoline Stocks bbl.	IMPORTS Daily Total bbl.	IMPORTS Gasoline %
Week Ending Dec. 6	2,226,936	2,187,000	37,742,000	251,857	16.7
Week Ending Dec. 13	2,240,278	2,285,100	37,680,000	262,286	8.9
Week Ending Dec. 20	2,202,761	2,333,100	38,621,000	195,428	14.1
Week Ending Dec. 27	2,144,074	2,207,400	39,388,000	284,142	5.7
Week Ending Jan. 3	2,089,437	2,095,300	39,780,000	262,571	7.7
Week Ending Jan. 10	2,081,010	2,145,300	39,583,000	270,143	10.3
Week Ending Jan. 17	2,080,247	2,218,300	40,384,000	245,571	19.4

Underlined figures indicate improvement in statistical position:—decrease in production, runs to stills, gasoline stocks or imports.

Crude Oil Prices

MID-JANUARY.

THE Champlin Refining Company further continued its policy of attempting to upset the crude-oil market by extending its early December reduction of crude oil prices to 67c flat per bbl. (effective December 29th) from 87c, as compared with $1.07 per bbl. as posted by major purchasers (for 40°B crude). On the other hand, the Cosden Oil Company (its receivers) resumed paying the posted prices in Howard and Glasscock Counties of Texas, affecting some 8,000 bbl.

In general, considerable strengthening of prices has been noted throughout the Mid-Continent area. Pipe line connections with the larger producing properties are being sought, and an increase in crude oil prices from $1.07 to $1.25 per bbl. should be made in the near future, provided, of course, proration agreements do not break down. However, a new factor of paramount importance is being felt now—the development in the Northeast Texas (Rusk County), where large wells have been completed from 3,600 feet. In an attempt to delay this new development, as well as wildcatting elsewhere, a radical cut in crude oil prices is being generally predicted. Considering that current production is approaching 2,000,000 bbl. per day, the lowest in four years, and that the Rusk County could be prorated, as other areas of Texas are, the cut, if made, appears to be entirely unjustified, and may very likely result in terminating proration, reducing to naught all constructive effort of 1929 and 1930.

(On January 14, the Humble Oil & Refining Company, S. O. Co. of N. J., posted a new Crude price in Texas, reducing the prices from 2 to 28c. per bbl., the cut of 40° B. oil averaging 20c. The areas affected include the northern part of Texas, Texas Panhandle, and the Gulf Coast. This cut was met by all purchasers. Until January 23 no further cuts elsewhere in the Mid-Continent area were made.)

Imports

IMPORTS continue at unduly high figure, accordingly agitation for tariff (or embargo) is gradually increasing as reported elsewhere in this issue. However, if a tariff is passed, its value will be only psychological, and only until a new scapegoat is found by independent producers. As long as oil exports greatly exceed imports, both in volume and value, enactment of an embargo or high tariff might prove to be of questionable benefit.

Proration

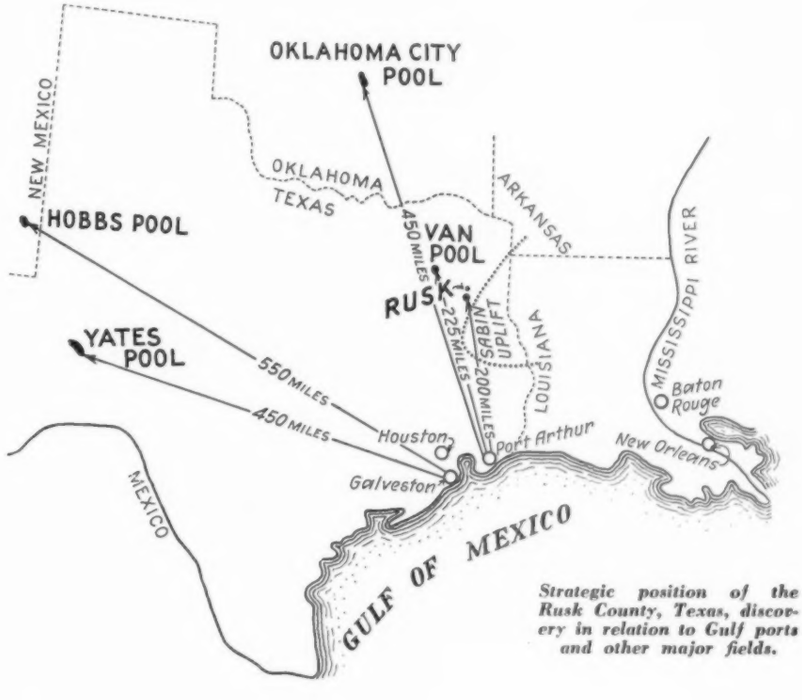
REGARDLESS of considerable anti-proration propaganda and publicity, given by the self-sufficient companies, the situation continues firm, and the proration is continuously gaining new followers. A reduction in the U. S. A. production during 1930 of about 110,000,000 bbl., as compared with 1929, is the best testimony that the proration is a great success.

Pipe Lines

THE Prairie Pipe Line Co. ceased all its crude purchases after the 1st of January, as it intended to do. The less valuable properties, formerly connected to Prairie lines, will probably be abandoned, while fields with sufficient aggregate production are securing connections from Stanolind, Magnolia and other companies. Though affecting very many smaller producers, the above indicated readjustment can be considered as a normal evolution within the oil industry.

Northeast Texas-Rusk County

THE close of 1930 witnessed a major discovery of large production in an entirely new area of Texas. The im-



Strategic position of the Rusk County, Texas, discovery in relation to Gulf ports and other major fields.

portance of this development is very greatly enhanced by its proximity to the refining and exporting points along the Gulf Coast, 200 miles, and also by the lightness of the crude oil which averages 40 deg. Be. The depth to the producing horizon, the Woodbine sand, is shallow, 3,600 feet, and consequently the wells are quickly and cheaply completed ($15,000 for dry hole and $25,000 for a producer). The producing area is crisscrossed by railroads, and also is within few miles of the recently completed 10-inch pipe line of the Humble Oil Co. (S. O. of N. J.), which was built recently into the Van pool.

Of greatest importance is the fact that Rusk County wells indicate the opening of a major district, rather than an individual field, the prospective area covering the counties immediately due west and south from the Sabine Uplift (see map). Geologically—the accumulation of oil is found in the shore-line deposit of the Woodbine sand, which pinches out to the east, as it begins to overlap the Sabine Uplift. The completions to date indicate considerable irregularity of the sand conditions, its thickness and porosity, and consequently the area may, and probably will, prove erratic and discontinuous, though locally very large fields will be opened. Wells completed to mid-January are:

		Farm	Initial Production bbl.	Total Depth feet	COUNTY
Joiner et al (discovery)	No. 1	P. Bradford	450	3592	Rusk
H. L. Hunt (offset)	No. 1	D. Bradford	50	3650	Rusk
Anderson et al (offset)	No. 1	D. Bradford	60	3592	Rusk
Stroube et al (offset)	No. 1	Frederick	130	3618	Rusk
Tex-Lloyd Oil Co. (offset)	No. 1	Camp	2,000	3594	Rusk
C. Rosenfield et al (2½ miles South from discovery)	No. 1	Pinkston	dry	3602	Rusk
Foster-Deep Rock (1 mile West from discovery)	No. 1	C. D. Ashby	9,000	3615	Rusk
E. W. Bateman et al (10 miles North from discovery)	No. 1	L. D. Crim	20,000 & 5 million gas	3650	Rusk
Moncrief (25 miles North from discovery)	No. 1	J. K. Lathrop	(cored 8 ft. of saturated sand, TD 3572'.)		Gregg

It should be noted that an area which was discovered in October, 1930, and where large production was found in the middle of December, 1930, by the middle of January, 1931, has an indicated length of 25 miles and a width of one mile, and appears more important than either Kettleman Hills or Oklahoma City pools. The leases in Rusk and adjoining counties are divided in small tracts, and considerable amount of drilling is anticipated during the coming Spring and Summer, mostly by independent operators, because of small development cost and availability of drilling locations.

At this time there are in this area 38 operations, of which 14 are drilling, 18 are rigging up and 6 are locations.

New Mexico-Hobbs

THE indicated potential production of this field reached 1,076,329 bbl. from 134 wells on 122 units of 40 acres each. The current allowance is 31,207 bbl., or 2.90 per cent of the potential. Only 10 wells are now drilling in the Hobbs field.

Oklahoma-Oklahoma City

TOTAL completions in Oklahoma City pool reached 684. The proration method is being changed from fractional time to fractional flow, and at this time well potentials are being taken, on the basis of 4 hour flows. The allowable production is based on 1.5 per cent of the potential.

BASIL B. ZAVOICO.

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Motor Spirit On the American Market

THE retail market in the United States in recent years has tended to become complicated on account of the large variety of fuels, with and without ethyl and benzol, offered to the motorist and the corresponding range of prices at the same filling station. The motorist now has his choice of low price and high price gasoline, and he makes his selection on the basis of advertising appeal or his own indefinite experience.

In order to see what definite properties distinguish the "high test" or premium-price motor fuels from the "low test" or competitive-price gasolines the U. S. Bureau of Mines made a survey of the motor gasoline marketed in 20 cities from New York to San Francisco. In this survey the inspectors bought 298 samples, divided between ordinary-price and extra-price gasoline. These samples were then analyzed in the government laboratories. The general results are shown in the table in the next column.

In so far as the gravity and vapor pressure are concerned the grouping of samples into "competitive-price gasoline" and "premium-price motor fuel" does not seem to disclose any striking difference between the two groups, each considered as a whole. The average gravity of the two groups is the same. The vapor pressures are about the same in each class with an average of 7.2 pounds per square inch for the competitive-price gasoline and 7.0 pounds for the premium-price fuels.

Characteristics of High and Low Priced Gasolines

(Average of 298 samples from 20 cities)

	Competitive Price Gasoline	Premium Price Motor Fuels
Specific gravity	0.746	0.746
Degrees A.P.I.	58.2	58.2
Vapor Pressure	7.2	7.0
Distillation data in Deg. F.:		
First drop	98	99
10% evaporated	149	146
20% "	184	176
50% "	265	250
90% "	372	352
End point	406	392
Average boiling point	261	248
Per cent recovery	97.3	97.4

The lowest temperature at which 10 per cent was evaporated was 118° F. for a premium-price fuel from Omaha, and the highest 163° F. for a competitive-price gasoline from Tulsa; the vapor pressures of these two samples were 9.0 and 5.9 pounds respectively; but in many cases the vapor pressure of the low-price fuels was distinctly greater than that of the high-price gasoline.

The chief character which seems to distinguish the two classes is the degree of volatility as measured by the distillation data. At all stages of the evaporation process the temperature of distillation of the high-price fuel is lower than that of the low-price fuel; this difference is seen in both the end point and the average boiling point.

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U. S. A. Petroleum Imports

	1929 (Barrels)	1930 (Barrels)	Decrease or Increase
Crude Oil	62,129,419	78,932,572	—16,803,333
Refined oils	29,632,000	43,380,000	+13,748,000
Gasoline	8,834,000	16,926,000	+ 8,092,000

Of the crude imports those from Venezuela amounted to 25,299,000 bbl., or a reduction of 9,132,000 bbl. from 1929. Colombia's crude shipments were 12,120,000 bbl., or a reduction of 2,084,000 bbl. Nearly all the gasoline came from Curacao, Aruba, and Trinidad.

FINANCE

New York

THE latter half of December and first half of January witnessed further low levels in the general market and in prices of oil shares, followed by moderate recovery in keeping with the somewhat better sentiment after the year-end. Trading volume has been light and price fluctuations comparatively narrow thus far in the new year, signifying a sounder technical market condition than prevailed a year ago.

The general downward trend in gasoline prices seems to have been arrested, with some strengthening of bulk prices in various sections. Crude prices have been subject to further scattered downward revision, but this movement also seems likely to have come to its end, unless the present agitation in Oklahoma against proration should prove more effective than expected and force a breakdown of curtailment.

THE financial difficulties with which Richfield Oil Company of California has been struggling for a number of months have finally culminated in Federal receivership for the company. An over-ambitious expansion program, particularly in entering the already highly competitive Atlantic Seaboard marketing territory, coming in a period when the whole trend of the industry was becoming less and less favorable to profitable operations, seems to have been the primary cause of the inadequate financial position. The receiver, William G. McDuffie, had been elected president of Richfield only three weeks previously in an attempt to work out some plan of rehabilitation, and had been president of Pacific Western Oil (a small Pacific Coast producing unit) since its organization some three years ago. In order to serve as receiver Mr. McDuffie resigned from both of these offices. The receivership complaint, to which the company consented without contest, alleges that Richfield has outstanding in excess of $19,000,000 of unsecured claims in addition to more than $24,000,000 of its own 6 per cent bonds and more than $9,000,000 in bonds of Pan American Western, a subsidiary. In addition there are outstanding 339,900 shares of preferred stock and 2,071,071 shares of common. It was announced on January 26 that the Cities Service Company, holder of a substantial amount of Richfield common stock, is prepared to exchange one share of Cities Service common for four common shares of Richfield of California up to 500,000 shares of Richfield. Some of the Richfield stockholders already have opposed the proposal.

BREAKING its usual rule of reticence Texas Corporation recently issued a special statement to stockholders revealing an official estimate of 1930 earnings and indicating probable dividend action in the near future. Net income of around $15,000,000 is indicated, equal to about $1.52 a share, a sharp reduction from the $4.90 a share reported for 1929. Cash and other liquid assets at the year-end approximated $65,000,000 or around $6.60 a share. The management feels that such a strong financial position would make possible maintenance of the present $3 dividend rate for at least another year under present earning conditions without seriously weakening the treasury position. The statement pointed out that the actual dividend policy would have to be determined by the directors from time to time according to conditions and outlook prevailing; but clearly indicated the presumption of the intention to continue the present rate, at least for the time being, even though not covered by current earnings. Certainly one of the objects of conservative bookkeeping and moderate dividend payments in years of large profits should be to enable just such action in periods of temporary adversity.

IN marked contrast to the average character of income statements for 1930 expected from oil companies, Indian Territory Illuminating Oil Company, controlled indirectly by Cities Service through Empire Gas & Fuel reported for the year ended Oct. 31 net after all charges of $11,693,000, more than three times the profit of the previous fiscal year. Part of the gain is no doubt due to acquisition of new properties, but the company's most valuable holding contributing to this fine showing is perhaps its large interest in the Oklahoma City pool.

New York Stock Prices

1930-31 High	1930-31 Low	Current Div. $ per Annum	Stock (Par value)	December 8 to January 17 Sales (Shares)	First	High	Low	Last	Net Change [1]
51⅛	16½	†2.00	Atlantic Refining (25).....	175,900	20⅛	22⅝	16⅝	20⅛	+ ⅝
34	8⅝	1.00	Barnsdall "A"(25).....	217,200	14¼	14¼	8⅝	12⅛	— 2⅛
8¼	1⅛	....	Colon Oil (No).....	29,100	2⅛	2⅛	1⅛	1⅝	— ⅝
30⅛	7¾	....	Continental Oil (No).....	357,700	11	11⅝	7¾	9⅜	— 1⅝
7⅝	3	....	Creole Petroleum (No)....	57,300	3¾	3⅞	3	3⅜	— ⅜
166⅞	58½	1.50	Gulf Oil Corp. (25).....	88,200	73¼	75½	58½	67⅞	— 5⅛
119	57¼	2.00	Humble Oil & Ref. (25)....	49,200	67¾	67¾	57¼	60	— 7¾
30	15	††1.00	Imperial Oil, Ltd. (No)....	58,700	17½	19	15	17½	— ⅛
28¼	3	....	Indian Refining (10).....	192,900	4	4⅛	3	4	.....
24	11¼	1.00	International Petr. (No)...	107,900	14⅜	15⅛	11⅝	14⅞	+ ⅜
37	9¾	....	Mexican Seaboard (No)....	210,800	12⅛	14⅝	10	13⅞	+ 1⅝
32	16	2.00	Ohio Oil (No).....	136,100	18¼	19⅛	16	17⅜	— ⅛
67½	30	....	Pan Amer. P. & T. B. (50)	4,600	42	42	30	35	— 8
44⅜	11½	**2.00	Phillips Petr. (No).....	630,300	16½	16⅞	11½	12⅛	— 4⅛
54	11¼	2.00	Prairie Oil & Gas (25).....	76,400	17	18⅞	11¼	13⅞	— 3⅛
27¼	7⅝	....	Pure Oil (25).....	217,500	10½	11⅞	7⅝	10¼	— ⅛
28¼	2¾	....	Richfield Oil (No).....	352,800	7¼	7¼	2¾	3⅝	— 3⅞
56½	36⅞	*3.20	Royal Dutch, N. Y. (13⅓)..	83,000	41¾	41⅝	36⅞	39⅜	— 1⅜
25½	5¼	....	Shell Union (No).....	226,500	8⅝	10¼	5¼	9½	+ ⅜
32	9¾	1.00	Sinclair Consol. (No).....	420,500	12¼	13¼	9¾	11⅝	— ⅝
42	8½	....	Skelly Oil (25).....	76,500	12½	12⅞	8½	9	— 3½
75	42¼	*2.50	Standard Oil of Calif.(No)	228,900	48⅛	50½	42¼	47	— 1⅞
59⅜	30	2.50	Standard Oil, Ind. (25)....	334,500	36⅝	38½	30	36⅛	— ⅝
40½	18⅞	††1.80	Standard Oil, Ky. (10).....	94,800	22⅝	23⅛	18⅞	22⅛	— 1⅛
84⅞	43½	†2.00	Standard Oil, N. J. (25)....	952,500	51⅝	52⅝	43½	46⅞	— 5⅛
40⅝	19¾	1.60	Standard Oil of N. Y. (25)	445,100	25	25⅝	19¾	23⅝	— 1⅝
.70	39	††1.00	Sun Oil (No).....	14,100	49	49	39	40	— 9½
60½	28¼	3.00	Texas Corp. (25).....	443,000	35½	36¼	28¼	31¾	— 4½
17⅝	5¾	0.60	Tide Water Assoc. (No)....	151,900	7⅜	9	5¾	7¼	— ⅜
50	20⅝	‡2.00	Union Oil of Calif. (25)....	94,200	25	25½	20⅝	23	— 2⅛
97⅞	45⅝	†4.25	Vacuum Oil (25).....	105,600	63¼	63¾	45⅝	57⅛	— 6⅛
4½	⅝	....	Venezuelan Petr. (5).....	26,100	1⅜	1⅞	⅝	1⅜	+ ⅜

[1] Since close of last month's table. * Paid last year—no regular rate. ** Plus 5% in stock. † Including extras. ‡ Plus 4% in Stock. †† Plus 9% in stock. * Plus 2% in stock.

LATEST reports, following breakdown of merger negotiations with Sinclair, link Prairie Oil & Gas and Prairie Pipe Line as considering direct merger between themselves. As of January 1 Prairie Oil & Gas withdrew as a purchaser of crude from Oklahoma, Kansas and Panhandle Texas on account of insufficient marketing outlets and heavy stocks of crude on hand. This left production from about 33,000 small wells, amounting to more than 40,000 barrels daily, without outlet. Substantially more than half of this is being taken care of, largely through Standard of Indiana, and efforts to care for the balance are being continued. Prairie Pipe suffered a decline in volume of oil delivered in 1930 of about 25 per cent and is expected to report around $3.80 per share. Further payment of extra dividends is unlikely, and the regular $3 basis cannot be considered well secured in view of the outlook for continuance of lower levels of operations. Prairie Oil & Gas undoubtedly also suffered a sharp decline in earnings in 1930 and is probably not covering its $2 dividend rate at the present time.

THE lower prices and profits of the industry have brought several announcements of modification in dividend rates and others are likely to follow. Sinclair Consolidated and Barnsdall have reduced their rates from $2 to a $1 annual basis; and Skelly, a comparatively small Mid-Continent unit with a substantial interest in the natural gas industry, has omitted payments on its common stock.

CONSOLIDATED report of Sun Oil Company for 1930 shows net after all charges of $7,745,484, equal after preferred dividend payments to $5.10 per common share based on the shares outstanding prior to the 9 per cent stock dividend paid at the close of the year. The year-end inventory adjustment, equal to nearly $1 a share, more than accounted for the reported decline from 1929 results, which were equal to $5.60 per share.

C. C. BAILEY.

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Paris

EXCEPT in a few rare cases, oil shares have continued to fall on the Paris Bourse during the past month. There seems no redeeming feature to relieve a dull horizon. The defeat of the Tardieu Cabinet, followed by several vain attempts on the part of different leaders to form a Government, as well as the fact that the Steeg Ministry once formed, was obliged to close the Parliamentary session in order to gain time and thus insure remaining in office until after the New Year, are not factors which tend to encourage optimism in financial circles. On the whole, however, the situation seems to be easing up a little, and stocks are not losing ground as rapidly as they did in Otcober and November.

THE most important event of the month is undoubtedly the annual meeting of the shareholders of the S. A. Malopolska, which was held on the 31st of December. This meeting aroused a great deal of interest on account of the company's connections with the Credit General des Petroles, whose financial situation at the end of November was crucial.

It will be recalled that the S. Malopolska forms the most important part of the Credit General's industrial assets, and that in November, owing to the liquidation of the S. Financière de Paris, an organization which partly financed the S. A. Molopolska, the Credit General des Petroles was on the verge of bankruptcy.

The S. Malopolska is at present endeavoring to secure financial aid which will enable it to pay up the debts which it has incurred with the S. Financière de Paris, and which are payable immediately owing to that company's liquidation.

The net profit declared by the S. Malopolska for the financial year ending on June 30th amounted to f 32,584,426, which the Board of Directors propose to put aside for depreciation and reserves. This the shareholders have consented to as a precautionary measure, given the precarious position in which the company is situated.

On the whole, the company's report tends to show increased activity during 1929-1930. It had a great many more wells operating in Poland, but total production, nevertheless, only amounted to 1,790,313 bbl. as against 1,755,026 bbl. in 1927-1928.

Two bubble towers were added to the company's refinery at Drohobycz in April last, which enabled it to increase the percentage of gasoline obtained from 14% to 19.6%. 2,100,907 bbl. of finished products were sold by Malopolska during 1929-30, as against 1,782,-896 bbl. the previous year, for a total sum of f 343,093,995 or $13,481,100.

OMNIUM PETROLIFERE DU NORD ET DE L'EST, one of the French holding companies, has closed its accounts for the financial year 1929-1930 with a deficit of f 1,354,224, compared with a profit of f 605,659 for the preceding year. This company, like others of its kind, seems doomed to disappear.

RESULTS obtained by the S. Franco-Wyoming, another holding company, appear to be good as a whole for the first nine months of the year. The company announces that it has collected dividends amounting to $613,381, as against $570,-340 obtained the previous year. This in the face of the existing crisis both financial and industrial, seems an excellent result, and the Company's direc-

Paris Bourse Prices

Div.	Par	Share	Price on Dec. 1	High	Low	Closing Dec. 31	Change	Closing on Jan. 5
50 lei	500 lei	Astra Romana	94	105	94	95	+ 1	85
....	500 lei	Colombia	73	75	67	69	— 4	68
50 lei	500 lei	Concordia	72	72	60	61	— 11	67
....	500 F.	Crédit Gal Pétroles act.	....	....	....	....	.....	....
....	.....	Crédit Gal Pétroles parts	....	....	....	....	.....	....
....	500 F.	Franco Pol. Pétroles act.	56	60	50	52	— 4	54
....	.....	Franco Pol. Pétroles parts	....	360	335	....	.....	....
1	10	Franco Wyoming	354	361	315	325	— 29	325
20 F.	500 F.	S. G. Huiles Pétroles act.	490	490	395	395	— 95	405
....	.....	S. G. Huiles Pétroles parts	181	184	145	145	— 36	135
....	500 F.	Cie Française Pétroles	....	580	....	....	.....	574
50 F.	500 F.	Cie Indus. Pétroles	845	850	849	849	+ 4	849
65 F.	500 F.	Lille Bonnières Colombes prio	950	1,040	899	899	— 51	898
40 F.	500 F.	" " " ord.	637	672	511	637	.....	615
....	500 F.	Malopolska act.	....	....	....	....	.....	....
....	.....	Malopolska parts	....	....	....	....	.....	....
....	.....	Mexican Eagle	53	53	43	48	— 5	....
17.50	250 F.	Omnium Inter. Pétroles	103	103	76	80	— 23	84
50 F.	500 F.	Péchelbronn	845	845	790	810	— 35	735
60 F. B.	500 F. B.	Pétrofina	488	488	435	435	— 53	450
240 Fl.	1,000 F.	Royal Dutch	31,975	32,300	29,015	29,100	—2875	30,600
24 Fl.	100 F.	Royal Dutch 1/10	3,190	3,260	2,913	2,935	— 255	3,075
5 Sh.	1 Lg.	Shell	476	482	442	450	— 26	465
25 F.	500 F.	Steaua Française	140	140	117	126	— 14	130

tors are to be congratuated upon the way they have invested their capital.

REFERENCE was made on page 567, December, to the Société Française des Pétroles Essences & Naphtes. The listing of the shares of this company on the stock market has been a deciding principle, but on account of the unfavorable situation of the Paris market, I am advised that the company has considered it preferable to delay the execution of this operation for the time being. It was stated that the company's licenses for Paris importation is 49,000 bbl. per annum. However, by the decree of March 31, 1929, the company's license is 700,000 bbl. per annum, and this will be increased by 10 per cent after the first of July, 1931.

E. J. ANDRE.

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London — January, 1931

IRREGULAR price fluctuations and extreme sensitiveness to external influences have been the outstanding characteristics of the London oil share market during the past month. Business has not been sufficient to give quotations any definite impetus in either direction, and movements have therefore been the result of sentiment rather than actual dealing. The market has been influenced largely by the weakness of New York and by spasmodic selling from Paris and other Continental centres. Fears of financial difficulties in some of the Northern provincial Stock Exchanges in Great Britain have also tended to depress quotations. Two sustaining factors have been the evidence of continued progress of restriction in the United States, and the existence of a London "bear" account in some of the leading shares. Several quotations have touched new low levels for 1930 during the past few weeks, but the opening of the New Year was signalized by a moderate improvement, leaving prices as a whole above the lowest points touched. Trinidad shares provided an exception to the general downward movement of prices during the past month. Leaseholds have fluctuated widely, and close with a substantial advance on balance, the improvement being attributed to the view that, with its own distributing organization in this country, the company possesses prospects justifying a higher price level than that recently ruling for its shares.

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DISCUSSING the outlook for 1931, operators are recalling that the past year opened with just such an advance in oil share prices as that which has taken place during the past week or so. Last year's cheerful opening reflected the view that most leading British oil companies were soundly financed and organized, that American restriction plans would fructify, and that petroleum products would be among the first to be favorably affected by the expected recovery. The oil share market was therefore singled out by Stock Exchange men a year ago as one of those in which the speculative investor would be fairly safe. Restriction of output has since made some progress, but world trade has declined instead of improving, and internal soundness of British petroleum producers and distributors has not prevented their shares from falling during 1930 to the lowest levels for several years.

LIKE the rest of the world, the Dutch colonial authorities are evidently alive to the necessity for conserving petroleum resources. In a recent statement regarding the projected law for the issue of new oil licenses, the Netherlands Government pointed out that no need is likely to arise during the next few years for any considerable increase in oil producing areas. Due consideration, however, is to be given to any outstanding applications for drilling rights where the interests concerned have so far had insufficient opportunity for extensions, and in cases where there is a certainty of effective exploitation and marketing. The restriction policy is doubtless a wise one, since any substantial addition to Dutch East Indies output might upset the carefully balanced plan for allocating markets which is in operation between the leading producers in the East.

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MEXICAN Eagle shares developed considerable activity following the issue of a satisfactory interim statement at the end of December. The official estimates for 1930 show that production increased by 903,952 bbl. to 12,858,000 bbl., and although purchases of crude were 1,190,805 barrels lower at 5,575,000 bbl., shipments increased by 4,255,241 bbl. to 19,110,000 bbl. Lower prices for petroleum products have again been offset by increased output and shipments, but the financial results for last year should not compare unfavorably with those for 1929.

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MARKET estimates of the Apex (Trinidad) dividend put the final distribution at 15 per cent, making 30 per cent for the year to September 30 last. This company paid 52½ per cent for 1928-29, but the directors had foreshadowed a decline in profits for the past twelve months. Having been looking for 15 per cent, operators were disappointed when a final payment of 10 per cent was announced, making the total dividend 25 per cent. A more favorable impression, however, was produced by the profit figures, showing net earnings of £202,597. Since its formation in 1919, Apex (Trinidad) has paid total dividends exceeding £1,400,000 on a capital, which now only amounts to £500,000.

ALEC H. DAY.

London Stock Exchange Prices

1930 High	1930 Low	Last Year's Div. % per Ann.	Share	December 6 to January 6 First	High	Low	Last	Change
1 1/32	3/4	3 1/2	Anglo-Ecuadorian	17/32	17/32	3/4	17/32	.....
2 5/8	1 23/32	22 1/2	Anglo-Egyptian "B"	1 27/32	1 27/32	1 23/32	1 13/16	— 1/32
4 23/32	2 3/4	20	Anglo-Persian	2 31/32	2 31/32	2 3/4	2 25/32	— 3/16
1 13/32	9/16	25	Apex Trinidad (5s.)	19/32	19/32	9/16	19/32	.....
2	7/8	....	Attock	1	1 1/16	15/16	15/16	— 1/16
5/8	1/4	12 1/2	Brit. Borneo (10s.)	9/32	9/32	1/4	9/32	.....
11/32	3/16	6 3/4‡	Brit. Burmah (8s.)	7/32	7/32	7/32	7/32	.....
1/4	1/16	....	Brit. Controlled ($5)	1/16	1/16	1/16	1/16	.....
3/4	1/2	....	Brit. Controlled Pfd. ($5)	3/16	3/16	1/32	1/32	— 1/32
4 31/32	3 9/32	30	Burmah	3 19/32	3 19/32	3 9/32	3 9/32	— 1/32
11/16	1/2	12c.	Canadian Eagle (No par)	3/4	3/4	1/2	11/32	— 1/32
1 1/4	5/8	....	Creole Petrol. (No par)	3/4	25/32	5/8	11/16	— 1/16
1/16	1/8	....	Kern River (10s.)	1/32	1/32	1/32	1/32	.....
2 31/32	1 1/4	12 1/2	Lobitos	1 13/32	1 13/32	1 1/16	1 13/32	.....
3/4	1/16	6	Mexican Eagle ($4 Mex.)	3/4	3/4	1/16	3/4	.....
68	32	....	Pan American "B"($50)	44	45	32	34 1/2	— 9 1/2
11/16	1/16	5	Phoenix	3/4	3/4	1/16	11/32	— 1/32
35 1/4	23 3/4	24	Royal Dutch (fl. 100)	26 1/2	26 1/2	23 3/4	24 3/4	— 1 3/4
4 31/32	3 17/32	25‡	Shell Transport	3 27/32	3 7/8	3 17/32	3 29/32	— 3/16
3/8	1/4	4	Steaua Romana	5/16	5/16	3/4†	3/4†	— 1/16
3 7/8	1	7 1/2	Trinidad Leasehold	1 1/16	1 1/2	1 1/4	1 15/32	+ 5/32
5/8	3/16	....	Untd. Brit. of Trinidad (6s.8d.)	7/32	3/4	7/32	3/4	+ 1/32
3 1/16	1 7/16	20	Venezuelan Oil Concessions	1 3/4	1 3/4	1 15/16	1 17/32	— 3/32

Nominal value of shares £1 unless otherwise indicated by bracketed figures.
‡ Denotes tax-free dividend. † Denotes "ex-dividend" price.
c. Denotes cents per share

SHIPPING

London —

THE New Year opened with shipyards on this side of the Atlantic at any rate moderately busy completing the influx of orders, chiefly for charter purposes, which they have had in the last eighteen months or so, but with little, if any, prospect of new work in sight. Taking a general average it would seem that completion work, and particularly if we take into account the large programmes of the Anglo-Saxon Company, Standard Oil Company and British Tanker Co., is likely to give reasonable employment to a number of Continental yards and to a very few British yards in the next six months. Beyond that time it would be unwise to make any prophecies.

It is scarcely necessary here to emphasize how fickle the demand for tanker tonnage can be and to point out that although the market may at the moment be entirely devoid of prospects of new construction, except for a possible tanker for the Argentine, in another few months the tables may be entirely reversed.

Chartering.

AT the moment the charter market reports from week to week appear to go from bad to worse and although as far as London is concerned, it is unquestionable that the intervention of Christmas and New Year holidays has had a great deal to do with the quiet state of the market, nevertheless it is an indisputable fact that there is far more tonnage offering for all grades of work than there is work for it. Also as far as the future is concerned, it is likewise indisputable that the heavy constructional programs which firms like the Anglo-Saxon Company now have in hand, the ships in which have been built specifically to owners' requirements, are bound to lessen the demand for charter tonnage. The whale oil trade offers a very reasonable outlet for modern tonnage and it is particularly suited to motor tonnage because of the long haul character.

Among recent fixtures there have been two motor vessels, one of which is particularly interesting in that it is one of the standard Anglo-Saxon tankers fitted with Werkspoor double-acting 4-cycle engines. This is the SPONDILUS of 9750 tons deadweight which has been fixed December/January for a round voyage Antarctic-Europe 7/-, fuel oil outwards and whale oil homewards. The KATY is one of the most recent of the Doxford opposed-piston Diesel standard 10,000 ton tankers and was only launched towards the end of 1930. She has been chartered for a similar voyage January/February for 6/9d. fuel oil outwards and whale oil homewards.

In one week recently there were fixed for voyages dated to commence January or February or December/January or March, and one even a prompt fixture, no less than seven motor vessels, one of which was a small German auxiliary ship with an iron hull of 2,800 tons. Two of these vessels were the ships hired for Antarctic whale oil business and one, the ATHELTEMPLAR of 13,000 tons with prompt delivery Trinidad-R. Plate 11/9d. crude and/or fuel oil, is particularly interesting in that she is one of the molasses tankers owned by that extremely successful concern, the United Molasses Co. of London. This is one of the few recent cases in which it has been possible to record a motor vessel hired for the clean oil trade. Of the four vessels fixed for the clean oil business, one was the BISCA, a 7500-ton Armstrong Whitworth standard tanker bokoed at the end of the year for a California-U. K.-Continent voyage at 15/10½d.; the other two vessels were both standard Norwegian ships.

As these notes close for Press, word comes of the chartering of two more motor vessels in the clean oil trade, one of which is a small ship of 2800 tons, the IRANIA, built specifically for the purpose of exploiting an entirely new type of marine heavy-oil engine. This ship has been taken for two voyages Russian Black Sea-Mediterranean ports.

Load Lines for Tankers.

MUCH comment is being exchanged in shipping circles on this side of the Atlantic on a hearing before the U. S. Load Line Commission of a proposal for permitting coastwise tankers to load ¼" to ½" per foot of draft in excess of the depth fixed by the International Load Line Rules, and particularly have shipping men been interested to note the agreement which was tentatively reached that the international summer load line should be applied throughout the year to coastwise tankers, this applying also to ships operating to the Hawaiian Islands and Porto Rico and between the Atlantic and Pacific coasts via the Canal, but not, however, to the Philippines. The proposal for raising the load lines for coastwise operation based as it is on the claim that less risk is involved in such operations by reason of proximity to ports and the comparative freedom from heavy storms, is regarded over here with some interest.

Central Control.

ADVANTAGES of central control of tankship operations were clearly demonstrated in the article last month on the fleet of the Royal Dutch-Shell group. Now Standard Oil is making for central control. As of January 1, 1931, integration of the foreign shipping operations of the various subsidiaries of the Standard Oil Company of New Jersey has been effected through the formation of International Company, Ltd., with head offices in Lichtenstein, one of the smallest principalities in Europe. Seventeen European subsidiaries are "pooled" in this one organization. R. L. Hague is the operating manager, and besides economies to be effected smoother functioning will result.

At the present time Jersey Standard has under way a construction program, consisting of 17 tankers in a three-year period. Eight were launched in 1930, and nine 16,000 tonners will be sent down the ways of German and Italian yards this year.

Special Hatch Covers for Tankers.

FROM the Report of the Load Line Committee 1927/28 it is clear that one of the principal reasons for accepting the idea of preferential treatment for tankers in the assignment of load lines was due to the efficient protection provided for weather decks by means of steel watertight covers. It is felt, however, by one Company over here that although existing tanker covers are satisfactory, there nevertheless is room for improvement. MacGregor & King Ltd., of Lloyds Avenue, London, have

accordingly evolved the "Macanking" tanker lid, the principle of operation of which has been extended also to the hatches for the dry cargo holds forward of the tanks.

The principal object of the tanker lid is to save time in opening up tanks and to dispense with men, and the method is to roll the lid off instead of lifting the hatch up. By this means, it is claimed that one man can do the work of four men in less time. Each lid has four wheels and each wheel is fitted with an accentric bush. The operator gives half a turn to each bush with a marlinspike and rolls the lid off. Close spaced fastenings are unnecessary, and there is no fitting up of tackles and posts and no burred or stripped nuts or bolts. Wedge-headed cleats secure the lid to the coaming with an even pressure on the packing all round and with suitable coamings there is no need of steel guard rails round each opening. All of which, it is claimed, results in a clearer deck and a more shipshape appearance. Macanking patent steel hatch covers are being fitted to the No. 1 hatches of ten new tankers building for the Anglo-Persian Oil Company, and Tankers Limited have specified Macanking lids and covers for any new construction which they may be laying down. It is only possible in these notes unfortunately to give the briefest outline of this arrangement, but it is felt that it is one that should be prominently brought to the attention of all tanker men.

New Construction.

LLOYDS Register of Shipping returns for the end of 1930 show that of 115 tankers under construction, no fewer than 104 are motor tankers. A 13,000-tonner built by the Deutsche Werft Yard, Germany, is now rapidly approaching completion and is of particular interest in that she is one of the largest vessels yet fitted and certainly the largest tanker to have a Lentz poppet-valve steam engine. The ship has been built for the Compagnie Nationale de Navigation, Paris, and is one of the first vessels built in Germany for French owners that has not been constructed under the Reparations agreement. She has a length of 465 ft., 10 in., a breadth of 61 ft., 6 in., a depth of 35 ft., 11 in. and a load draft of 26 ft., 6 in. Her Lentz engine will develop 3,000 i.hp., taking superheated steam from oil-burning boilers built by the shipbuilders. She is the third tanker which the Deutsche Werft have built for her owners. This same yard also delivered towards the end of last year a ship of 1,220 tons deadweight for work in the Baltic, propelled by M. A. N. Diesels of 1120 total s.hp. and which has steam driven auxiliaries. She is intended for the dirty oil trade.

Considerable interest has been aroused in British shipping circles by the completion on the Clyde of the electric tanker WINCKLER which has been built for the Atlantic Refining Co. of Philadelphia, Pa.

J. W. Van Dyke, chairman of this Company, and his two marine officials were present at the trials. The ship is the second of three Diesel-electric oil tankers which have been ordered by the Atlantic Refining Company on this side of the Atlantic. The first, the BRUNSWICK, was delivered in 1928, the second is now in service and the third is due for completion this year. Both in her hull structure where welding is used to a considerable extent, particularly under the engine seats and in her machinery arrangement, the WINCKLER presents a number of novel ideas to some of the more conservative-minded British shipping men. The vessel has, of course, all her machinery aft and in common with most of the other recent Atlantic Refining Co.'s tankers, her bridge is aft on the poop instead of being amidships which is the more stereotyped position. She has pilot house control with a Sperry link-up, the gyro repeater and automatic steering gear and the motor controls being arranged in the one pedestal. Lester M. Goldsmith, the Atlantic Refining Company's superintendent engineer, has a number of definite ideas on the subject of ship propulsion and he at least is prepared to back his confidence by incorporating them in his new design. The WINCKLER, it is to be noted, has electric cargo-handling pumps. Her gross registered tonnage is 6,900, she is intended mainly for the clean oil trade and has 2,800 horsepower on her single double-armature motor. The sister ship, PERMIAN, will follow shortly. In the vessel which this Company has recently ordered from the Sun Shipbuilding Company, the Diesel-electric principle will again be followed, and in another new ship for coastwise work, they will completely electrically weld the hull.

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Bound Volumes of World Petroleum

THERE are now available a very limited number of bound volumns of the editorial pages of WORLD PETROLEUM for 1930, with complete index. Price, bound in black half morocco, $12.50 per volume.

Deep Tests In El Mene Field, Venezuela

DURING the past year considerable drilling has been carried out in Venezuela and Trinidad by the British Controlled Oilfields, Ltd. A total of 2,080,-864 bbl. was produced on the company's property at El Mene, Venezuela, an increase over the previous year; but a temporary curtailment in flow is now being carried out in harmony with other Venezuelan producers. It was decided to carry out some deep drilling tests at El Mene, and after very careful survey by the geological department drilling was started on a site where the older concealed rocks would be lying at fairly flat angles of dip. The drilling confirmed the opinion. The hard formation continued to a depth of 4,100 feet, where both oil and gas shows were met. At 4,300 feet and at 4,500 feet further shows of oil and gas were met, and these and cores prove the existence of petroliferous formation down to a depth of 4,700 feet.

On the western extension of El Mene four test wells are drilling, and a fifth, completed last July, struck a rich 1,000 lb. pressure gas, and when deepened resulted in a splendid producer of a higher quality oil than that at the main El Mene field.

About $150,000 has been spent by the company in exploration work in the Orinoco Delta, and extensive operations will be carried on when suitable financing arrangements can be made.

In Trinidad the British Controlled Oilfields produced 643,940 bbl. during the year ending July 31st, 1930, a drop of 88,305 bbl.; but from August to November the output increased to an average of 79,500 bbl. Altogether the total production from all sources for the last fiscal year amounted to 2,714,985 bbl., and the company made a profit of almost $2,000,000. The issued capital is $22,500,000. Headquarters of the company are in Montreal, Canada.

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Venezuela Sends Engineers

SIX engineers are being sent by the Venezuelan Government to the United States for the purpose of studying the most advanced methods of petroleum production, refining, storage and transportation. The engineers making up this group are as follows: Manuel Guadalajara, Siro Vasquez M., Jorge Hernandez Guzman will go to the University of Tulsa, and Edmundo Luongo, Jose Montalvo, Jose A. Delgado Figuerelo to Oklahoma City.

The Foreign Oil Legion

C. A. McCLELLAND, overseas representative of the Reed Roller Bit Company, has recently completed a tour of the principal oil fields of the world. Very shortly he will return to the head offices of his company at Houston, Texas.

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CHRISTOPHER DALLEY of the British Controlled Oilfields, Ltd., has been re-elected president of the Oil Industries Club of London, England. It is hoped that before long permanent headquarters will be secured for the club, so that members of the oil industry from all parts of the world can find social headquarters when visiting London.

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J. W. VAN DYKE, Chairman of the Atlantic Refining Company, is back in the United States after a visit to Great Britain, where he attended the trials of a new Diesel-electric driven tankship built for his company. With him were R. C. Tuttle, marine manager, and Lester C. Goldsmith, marine engineer.

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R. W. HENDRICKS, chief production engineer for the Venezuelan Oil Concessions, Caribbean Petroleum Company, and other Royal Dutch-Shell interests in Venezuela, has just taken a seagoing vacation, making a short visit to New York enroute. He is now back in Maracaibo.

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J. W. BOYLE, an official from the London office of the Anglo Saxon Petroleum Company recently spent a week in New York on business for his company.

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DAVID S. PAUL, manager of the Technical Sales Department of the Anglo-American Oil Company, Ltd., recently returned to London after a month's stay in the United States at the New York offices of the company.

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RUSSELL PALMER, publisher of WORLD PETROLEUM, returned to New York on the S.S. BREMEN toward the end of January, following a trip to Europe in the interests of his oil journals, WORLD PETROLEUM of New York and London, and PETROLEUM WORLD of Los Angeles, Cal., and his sugar publications, FACTS ABOUT SUGAR, and EL MUNDO AZUCARERO of New York.

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G. LEGH-JONES, president of the Shell Company of California, recently arrived back in the United States on the S.S. MAJESTIC following a visit to London.

G. Legh-Jones,
President,
Shell Co.
California

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A. N. GLAZENER, assistant director of the Royal Dutch-Shell refinery at Curaçao, Dutch West Indies, is now in the United States and recently proceeded from New York to the Shell Company of California's headquarters in San Francisco. Mr. Glazener's portrait was published on The Foreign Oil Legion page in our issue of February, 1930.

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H. V. SHIRLEY, formerly with the Caribbean Petroleum Company in Venezuela, is now field superintendent of Trinidad Leaseholds Company, Trinidad.

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DR. RICHARD LEWINSOHN, Financial and Commercial Editor of the VOSSISCHE ZEITUNG, Berlin, and German correspondent of WORLD PETROLEUM, will visit the United States oil fields early this month.

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ARTHUR IDDINGS is the new general manager at Talara, Peru, of the producing and refining operations of the Tropical Oil Company.

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SIR JOHN CADMAN, chairman, Anglo-Persian Oil Company, recently flew from Egypt to Bagdad in connection with the construction of the new pipeline from the Iraq oilfields to Haifa and Tripoli.

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J. MC MULLIN, export sales manager of the Naylor Pipe Company, Chicago, arrived in Maracaibo, Venezuela, from Trinidad on January 14th.

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THROUGH the courtesy of the Imperial Oil Company we illustrate on this page a group of American petroleum drillers, who went to Java, Galicia, Germany and other countries in 1879, so are worthy veterans of our "Foreign Oil Legion." They are—Cyrus Perkins, Alvin Townsend, John Martin, A. E. Slack, Eugene Yager, Neil Sinclair, John S. Burgheim, W. H. McGarvey, George McIntosh, George Fair, Angus McKay.

The Foreign Oil Legion of 1879

Mexican View of Hydrogenation

Gustavo Oretga, Engineer of the Mexican Industrial Ministry's Petroleum Department Foresees World Wide Benefits from Hydrogenation of Oil and Coal . . . By Douglas Grahame

IN the latest edition of THE PETROLEUM BULLETIN, official organ of the Department of Petroleum of the Ministry of Industry, Commerce and Labor of Mexico, is an article entitled "The Industrial Base of Synthetic Combustibles" by Engineer Gustavo Oretga, of the Department, and one of the best petroleum statisticians of Mexico. The article is an interesting forecast of the world stores of liquid combustibles, and contains important comments as to Mexico's future as a petroleum production country. Engineer Ortega's article says, in part, as follows:

"After long years of persevering studies and patient experiments, it seems beyond doubt that a new industrial era in the production of synthetic combustible fuels has started. Although we cannot yet consider this matter definitely settled, the success attained is astonishing, not only in the laboratory but in the practical industrial field. This industry, however, has not yet been fully developed, but with what has already been accomplished, the refinery industry has received a great impetus. And, with it the advantages of the solid combustibles have attained a new plane. Coal receives supplementary energy from hydrogenation and is so enabled to produce a combustible of greater industrial and commercial value; the heavy oils and residue of distillation, especially those obtained by cracking can be transformed into gasoline, gas oil, etc.

"This wonderful thing has come about from the result of long studies and experiments by chemists in various countries, principally Germany, France, England and the United States. The greatest step, however, has been taken by Germany, when she sought to obtain the industrial realization on a grand scale of this notable development. A great chemical company of that country, I. G. Farbenindustrie, has constructed large laboratories which produce synthetic gasoline in enormous quantities by hydrogenation. Two of the greatest oil companies in the world, Standard Oil and Royal Dutch, have arranged with this company for the exploitation outside Germany of its patents for the production of synthetic hydrocarbons.

"It appears that the Standard Oil Co. has as its principal object the stabilization of the petroleum industry, it being by these means that the supply can be equilibrized, at will, of each product, according to the demand that each of them has. The importance of all this will be realized when one considers that by those means each country will be able to solve its own particular problem of the supply of liquid combustibles, now so necessary for the life and the progress of each nation, and even for their own security. The countries that have no petroleum, but have bituminous coals or other solid combustibles, will no longer be obliged to import, as they now do, great quantities of petroleum products, nor to depend upon those countries that possess such riches. At the same time, they will be able to take advantage, upon an unlimited scale, and without any loss of the deposits of heavy petroleum of asphaltic base, which is especially important for Mexico where a good part of the petroleum deposits produce petroleum of this kind, and from which it will now be possible to obtain a high percentage of gasoline.

"The important influence which petroleum products have on the prosperity of the various countries, explains the eagerness with which substitutes for them have been sought. Countries which lack petroleum, and have to import it, find themselves depending upon petroleum producing countries. Under certain circumstances, this can be dangerous as was proved during the World War with the defeat of Germany, which was due in part to her lack of petroleum. Civilization cannot be conceived of without the aid of this valuable element. Civilization demands enormous quantities of petroleum products. But petroleum wealth, at least that which has been calculated, has been heretofore the privilege of only a very few countries. All the others experience great difficulties in their industrial development, owing to their lack of petroleum which they can only use in limited amounts, paying high prices for it, despite very great industrial necessities. This originates a great disparity in the consumption of petroleum products, even among countries that are highly industrialized.

"In the matter of gasoline, we see that while in the United States the annual consumption per capita was in 1929, approximately 480 liters; in England, 94; in France, 41; in Germany, 27, and in Belgium, 25. The automobile has not been able to develop so rapidly in Europe as it did in the United States. Such a great disparity could be remedied, in part, at least, with the fabrication of synthetic combustibles, derived from solid combustibles, which many countries that lack petroleum possess. Solid combustibles, which formerly held first place, but were relegated to second, with the advent of liquid combustibles derived from petroleum, now begin to regain their importance, and will probably place themselves upon a plane of importance with petroleum itself, but not to compete with it, but to co-operate with it, to satisfy necessities of every kind that civilization has created.

"A most important aspect of this question will be the revival of activities in many coal mines, now paralyzed, being by this means the reason for the unemployment of thousands of workers both in the United States and England. The revival of mining activities will end this crisis.

"The advent of synthetic petroleum is not a menace for Mexico. Inasmuch as this country is not a great coal producer, it will have to employ its oil resources for its industrial, agricultural and economic development. Now, Mexico's petroleum will be more esteemed than ever, as it will be possible to reach the 100% output of its light products by the application of the hydrogenation process, a thing that no longer seems to be difficult to judge from the results obtained in the German laboratories, where 100 per cent gasoline is obtained from crude oil.

Mexican Petroleum News and Notes

by Douglas Grahame

PRELIMINARY estimates of the Mexican Treasury Department indicate that Government revenues from petroleum production, export and import taxes during 1930 were the lowest received in recent years. According to data furnished by the Bureau of Special Taxes, the Government derived an income of only 8,745,058 pesos (about $4,372,529 U. S.) from these sources last year.

December was the poorest month of 1930 from the standpoint of petroleum taxations income, as will be seen by the following official figures.

Mexico Petroleum—in Pesos

Month	Production	Exports	Imports
January	337,808	257,954	903
February	332,736	252,598	907
March	375,878	255,537	297
April	372,696	290,492	1,113
May	540,249	345,101	841
June	596,404	387,846	4,565
July	554,736	385,439	12
August	514,522	318,399	17
September	467,754	308,702	2
October	388,667	282,396	4
November	334,348	282,736	....
December	326,333	228,049	....

The Bureau announces that it is anticipated that 1930 will prove to have been a good year in point of revenues from gasoline production and importation taxes. This hope is based upon the official returns from these sources for November which were: 1,016,028.48 pesos (about $500,008 U. S.) of which 674,665 pesos were derived from production, and 341,363.48 pesos from importation.

A PETITION urging that coal be used instead of petroleum as locomotive fuel on most of its divisions, has been sent to the management of the National Railways of Mexico by the Union of Engineers, Firemen, Conductors and Brakemen of the Second Division of the state of Coahuila. The petition has the backing of most Coahuila chambers of commerce and carries the signatures of more than 5,000 residents of that state. The petitioners argue that while oil is cheaper than coal as fuel for the railways, the use of the dry fuel will be more economical in the long run. It is contended that oil burning locomotives are short lived, but that coal burners which were put in service 25 years ago are still in use. Another argument is that the wide use of coal by the railways will tend to solve the unemployment problem by reviving the activities of the coal mines. It is also contended that using coal as fuel will keep more money in the country, and it is declared that the purchase money for oil largely benefits foreign companies, and that most of this money is sent abroad. The railways in question operate more than 11,000 miles of track which serves three-fourths of the Republic.

THE Huasteca Petroleum Co. has brought 12,750,091 liters of gasoline to Tampico from the refineries near the coast of Venezuela, for storage in Mexico in view of the overproduction in South America. The company paid about $301,000 U. S. in import duties on the consignment. It is understood that the company will make other large importations into Mexico of Venezuela refined gasoline for storage purposes.

THE national petroleum reserves in the state of Coahuila have been greatly expanded by the Ministry of Industry, Commerce and Labor, acting upon a presidential decree to that effect. As a result of the expansion, the Ministry has rejected applications for concessions to several oil land tracts in the region.

THE Mexican Eagle Oil Co. has completed 100 kilometers of the pipe line it is building from Palma Sola to Mexico City, which will be 220 kilometers long. Ten-inch welded steel pipe is being used for the entire distance. Although machinery would be cheaper, the Martin Co., contractors for the pipe line job, are employing 800 men in digging the ditch in which the pipe is laid. The hand force was employed to give the men jobs and to relieve the unemployment situation along the route of the line. Seven electrically-driven booster stations will be installed along the route.

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Dubbs-Standard-Shell Deal

THE Shell Union Oil Corporation and Standard Oil Company of California have acquired control of Universal Oil Products Company, a company which was created and sponsored by the late J. Ogden Armour to develop and exploit the well-known Dubbs cracking process of producing gasoline from crude oil. It is understood that under this transaction, which also involves the making of various license agreements, Mrs. Armour and her associates will receive a total of $25,000,000, payable over a period of years. Mrs. Armour has received $3,190,812 in cash, and will receive $5,025,240 in three annual installments.

The stock of the Universal Oil Products Company will go to United Gasoline Corporation, a majority of whose stock, in turn, will be owned by Standard Oil Company of California and the Shell Union Oil Corporation, and the balance of the stock will go to the old stockholders of Universal Oil Products Company. No public financing is contemplated.

The Shell group and the Standard Oil Company of California have been the largest licensees and users of the Dubbs Process. J. C. van Eck, president of Shell Union Oil Corporation, and Richard W. Hanna, vice-president of Standard Oil Company of California, stated that their companies had purchased paid-up licenses and this transaction will, therefore, relieve their respective corporations of large annual royalty payments, and that they expected that the acquisition of Universal Oil Products Company will result in a substantial benefit to the oil industry, as it is intended to license the Dubbs process broadly.

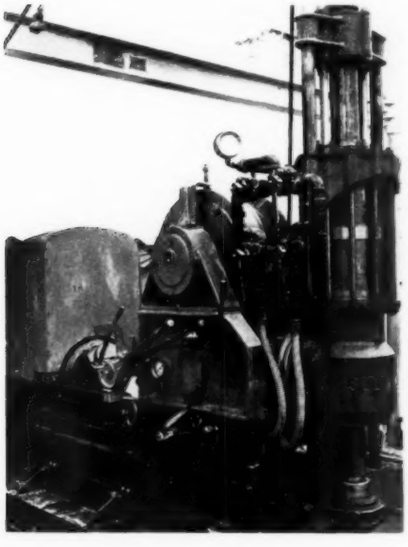
They further stated that they were firm believers in the Dubbs process and hope to acquire for it an increasing use by the industry. H. J. Halle, who accepted the presidency of Universal Oil Products Company at the instance of the late J. Ogden Armour in 1915, and to whose efforts is due, in a large measure, the success of Universal Oil Products Company, will head the newly formed United Gasoline Corporation in the capacity of president.

New Equipment and Engineering Information

Diamond Drill

A WELL in New Zealand was spudded in on April 25th of this year with a Sullivan drill, using a 25-in. bit; 22 days later 303 feet of 21½ inch casing was cemented through difficult agglomerates. Two months and nine days later 16 inch casing was cemented at 1,956 feet.

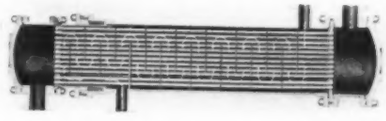
The ability of modern diamond drills to make holes as large as 25 inches in



diameter, is of interest to oil men. This is especially so as the diamond drill conbines the ability to make large holes, with the ability to drill through two more strings of casing than other equipment.

Condensate Pumps

SINGLE stage condensate pumps are announced in a new leaflet by the Westinghouse International Electric and Manufacturing Co. These pumps are used principally where low operation heads are encountered, multistage units being furnished for applications where high pumping heads prevail. They have been developed to meet the demand for efficient reliable units with low installation and operating costs, and are of the horizontal, volute, centrifugal type employing a double section impeller with opposed inlets.



New Type Heater Exchanger

HEAT economy is a detail that is attended to in all well regulated oil refineries. The Struthers-Wells type F exchanger shown here in section has been developed with particular reference to overcoming interleakerage, which is one of the most annoying sources of trouble in heat exchanger operations. The object aimed at has been accomplished by employing no internal joints with gaskets, but an extra deep outside jacked stuffing box around guide sleeve, an improved type of split ring with solid backing ring, and a proved type of longitudinal baffle seal which prevents by-passing.

New Viscosimeter

EVERY oil refiner knows the importance of controlling the viscosity of his lubricating and engine oils. A new industrial viscosimeter is announced by the Visco-Meter Corp. In this instrument a constant pressure is employed instead of gravity to force the test liquid through the capillary tube; the viscosity readings are read directly from a gauge in Saybolt units. No stopwatch is necessary, and the viscosity of an oil product can be checked over a range from room temperature to 300° F. in a few minutes.

Crossing Boring Machine

TIME is money in laying pipe lines, and digging trenches across highways annoys the public and is expensive. The new road-crossing boring-machine put out by the Young Engine Corp. is here shown installing 300 feet of an 8" pipe line under the Erie tracks at Jamestown, N. Y., in such a short time that the publicity agent of the company will not specify it for fear of being accused of . . . exaggeration. The cutter head on a hollow sleeve is forced forward by jacks (see figure) and rotation is imparted by a worm gear reduction. Dirt is removed through the

hollow sleeve by means of a spoon attached to a long pipe handle, or by water when available. When the hollow sleeve has advanced its full length it is unbolted, an extension joint is bolted in, and operations are resumed.

New Wrench

THAT there is room for improvement in most things, even pipe wrenches, has been shown by the Walworth Co., originators of the famous Stillson wrench which has been the standby of pipe fitters for 60 years. The Stillson is still a good wrench, but it has to have a malleable iron frame which unless carefully handled will not stand the severe treatment it often gets in an oil field.

New drop forge machinery preferred by Walworth makes it possible to forge the bar or handle integral with the frame, giving maximum strength to the nut housing.

Mapping Crooked Wells

CROOKED oil wells are always sources of annoyance and loss. How to rectify a crooked hole is a matter of finding what kind of kinks it has and where they are. Several ways of determining the orientation of an oil well have been devised. Among the most useful of these is the Surwell Gyroscopic Clinograph, which consists of the three units shown in the accompanying illustration; one is a gyroscope, with a small motor, another is a camera, and the third is a box-level gauge. The three are placed one behind the other in a special tube and lowered into the well suspected of crookedness. The gyroscope controls a pointer which always points in a north and south direction; the box-level gauge has a bubble indicator and a scale which shows deviations from the vertical; the function of the cameras is to take a moving picture of the compass and the level indicator as the outfit is lowered into the hole, and at the same time it photographs the face of a watch so that the exact position of the instrument at any moment can be calculated. The result is a record from which the course of the well can be accurately plotted.

For most purposes of well drilling, an instrument that registers only departures from the vertical will suffice. An improved instrument for this purpose is

the Syfo Clinograph. Both are made by the Sperry-Sun Well Surveying Company.

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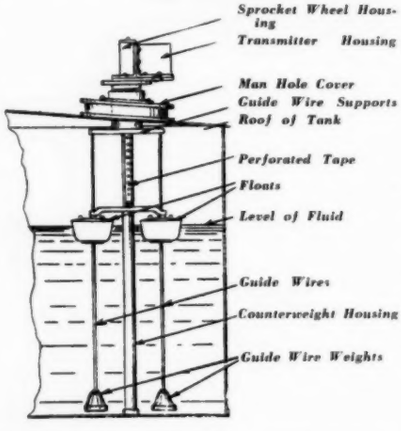
Gauging Fluid Levels

THE introduction of the MacCready fluid level indicator, a simple, scientific remote control for indicating the fluid levels of reservoirs or storage tanks,

with special reference to the oil industry, is announced by J. H. Bunnel and Co. From an instrument panel set



up in the pump station, which may be miles distant from the tank farm, it is possible to take readings of the fluid levels in as many tanks as may be necessary, and within an accuracy of one eighth of an inch. The principle of the apparatus is shown in the accompanying diagram; special floats in the tank move a perforated tape connected to an electrical transmitter, which in turn sends an impulse to the distant indicator, the dial of which at all times shows the level of the fluid in the tank. This does away with cumbersome and slow hand gauging.

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Manufacturers' Publications

New House Organ

PETROLEUM RECTIFYING COMPANY OF CALIFORNIA, Los Angeles, Calif., have begun the free issue of a house organ under the title, "The Electric Dehydrator," in four pages and two colors. It will provide information on electric dehydration of oils and the "cut oil" problem in general.

Swivels

The National Supply Co., Toledo, O., have out a new bulletin, 50A, describing new types of swivels for oil rigs.

Gas Lines

A New Way of Designing and Building Gas Lines with Smithwelded Pipe, is the title of Bulletin No. 510, issued by the A. O. Smith Corporation, Milwaukee. This is less a manufacturer's advertisement than a practical and useful treatise on the cost of building long gas lines. It contains much important engineering data, and many descriptions and illustrations of actual jobs.

Gas Distributor

Bulletin 1230 of the National Supply Co. describes a new electrically operated timing device of advanced design, chiefly for use with Oilift displacement pumps. These are made in units which may be built up to control a large number of wells.

Reda Oil Well Pump

Reda Pump Co., Bartlesville, Okla., are now issuing their pamphlet No. 1 introducing the Reda pump unit, which is described as the only electrical oil pump with both the motor and the pump in a single unit at the bottom of the well.

Correction

On page 60 of the January issue of WORLD PETROLEUM it was erroneously stated that the Speeder trench pull shovel is made by the Bartlett-Osterhout Company, whereas it is made by the Speeder Machinery Corp.

DR. O. W. WILLCOX.